The New York State

Conservationist

State of New York Conservation Department

June-July 1956

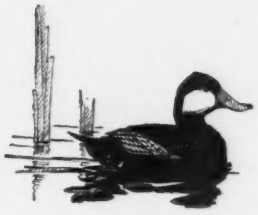
"The Rise," by Winslow Homer, 1900

Courtesy Charles R. Henschel

The New York State

Conservationist

JUNE-JULY, 1956



Contents

VOLUME 10 NUMBER 6

TOO MANY DEER?	2	*E. L. Cheatum*
REFORESTATION IN NORWAY	5	
RAISING CRAYFISH FOR BAIT	6	*John Forney*
PARADISE AT PARADOX	8	*D. L. Collins, C. J. Yops*
WAYNE COUNTY	10	*Roy Irving*
CONSERVATION LIBRARY, No. 3	11	
BEAVER TRAPPER'S DIARY	12	*Ed. Maunton*
THE COLOR OF TROUT	16	*D. C. Haskell, D. R. Brockway*
THE GYPSY MOTH	18	*Wm. E. Masterson, David Mitchell*
MONTEZUMA MARSH	20	*A. W. Bromley*
MOTHS AND BUTTERFLIES OF NEW YORK	22	*John A. Wilcox*
THE CORTLAND HATCHERY	27	*John R. Greeley, Arthur M. Phillips, Jr.*
LANDLOCKING ATLANTIC SALMON	28	*John R. Greeley*
MILLSITE LAKE	31	*A. W. Pearce*
THE BACK OF THE BOOK	32	*(Scattershots, etc.)*
LETTERS TO THE EDITOR	40	*(From Our Readers)*
BOOTSTRAPS FARM—No. 4	48	*Clayt Seagears*

A tragedy

This past Winter, with its severe temperatures and deep snows, brought into sharp focus a conservation problem which has been developing these many years, and which needed only the impact of such a Winter to bring it to a head.

We refer to the deer problem. Last Winter thousands of deer died—not just in the remote regions of the Adirondacks, where unfortunately such mortality has come to be taken for granted—but in farming country from the Massachusetts line on the East to Lake Erie on the West. They starved to death, or were so weakened by the absence of available food that they became easy meat for dogs. This was an act, but probably not the final one, in a tragedy that's been in the making all too long.

The biological history and facts which pertain to this problem are very ably presented on the following pages by E. L. Cheatum, Chief of our Bureau of Game. But there remains a question only hinted at on these pages, the Big Question: As the presumed masters of the animal kingdom, have we failed in our inherent responsibility to take proper care of lesser animals—such as deer?

The answer, provided by a long and carefully documented history culminating in the events of this past Winter, is clearly yes, we have failed. We may not be our brother's keeper, but if we are not the deer's keeper, then who is? It just isn't moral (or practical) to try to pass along this responsibility to Nature or God or some other Capitalized authority; this is our problem, and clearly we've muffed it.

Why this failure?

We don't mean to take an "I told you so" attitude, but it's worth noting that Department biologists in written reports have been predicting last Winter's tragedy for many years; the handwriting has been on the wall for a long time, and they have read it correctly, and have tried to pass along the message.

But the truth is that the basic biological facts which apply to the life and death of deer are still little understood by the general public. Also, they may be little understood, or deliberately ignored, by government administrators in a position to know the truth and act accordingly. And then, to compound the confusion, we have the writers and speakers who have introduced an utterly misleading and disastrous sentimentality about fawns and does and deer in general. They have done as much as anybody to destroy the very thing we all want to save.

The long and short of it is that we're confronted with an ugly situation. This is a situation of our own making (after all, we can't blame the deer) and it's our responsibility to solve it. Clear thinking, based on known facts and implemented by sound administrative action—that's what we need. And right now.—P. W. Fosburgh, Editor

STATE OF NEW YORK, AVERELL HARRIMAN, *Governor*
CONSERVATION DEPARTMENT, LOUIS A. WEHLE, *Commissioner*
JUSTIN T. MAHONEY, *Deputy Commissioner*
JOHN F. DALY, *Secretary*
CONSERVATION EDUCATION, CLAYT. SEAGEARS, *Director of Division*
THE CONSERVATIONIST, P. W. FOSBURGH, *Editor*
A. W. BROMLEY, ROLAND B. MILLER, *Editorial*
MICHAEL C. WALES, *Circulation Manager*
EARL McGUIRK, FRED CHAMBERS, *Photographers*
W. I. VAN DER POEL, JR., *Design and Typography*

TO SUBSCRIBE. Print your name, street address, zone and state. Send with $2 (check, money order or cash at senders' risk) to *The Conservationist*, Room 515, Arcade Bldg., Albany 1, N. Y. Three years for $5. Single copies $.50. NO STAMPS PLEASE.

Permission is granted to reprint any text from this magazine provided proper credit is given to the New York State Conservation Department and to this magazine.

The Conservationist is an official publication of the N.Y.S. Conservation Dept., published every two months at the Department's offices, Arcade Bldg., Albany, N. Y. No advertising accepted. Subscription rate $2.00 per year. Entered as Second Class matter July 24, 1946 at the Post Office at Albany, N. Y. under Act of March 3, 1879. Printed in U. S. A.

Too Many Deer?

ARE there ever too many deer? Why should a question of this nature be asked about this splendid wild resident of our woods and meadows? There are never enough deer for hunting enthusiasts—nor for those whose only interest is in observing them in Nature. There must be other points of view which stimulate this question and indeed there are—those of the orchardist, the truck gardener, the farmers whose crops are trampled and eaten by "too many deer," and of the biologists and foresters who see a natural deer range being destroyed by deer themselves, or watch deer forage disappearing as woodlands mature.

For several decades, thriving populations of the white-tailed deer have brought great recreational pleasure to millions of people, and grievous consequences to many landowners whose livelihood has been adversely affected by them. The management of these populations consequently has become one of the most controversial subjects confronting state conservation departments, and the Department of this State is no exception.

Vital statistics can be very dry reading, but unless we understand some of them as they relate to the question before us, we are in no position to grasp its scope. What is a reasonable estimate of the total number of deer in New York? How many adult does and bucks, how many fawns are born each year? What is their average life-expectancy? How many are taken by hunters?

From results of nearly 20 years of intensive research we are able to answer these questions with sufficient accuracy and confidence to put them to work in recommending management measures designed to control the size of those herds which are growing too large, either for tolerance of the landowner, or for welfare of deer themselves where they are destroying their own natural food supplies. Yes, there can be too many deer.

Our best estimate of total deer numbers in New York State runs from 350,000-450,000. This is derived in large part from annual deer-kill statistics and their distribution, and general knowledge of deer numbers per square mile of range to be found in each county occupied by deer. If we accept the figure of 400,000, chances are no one will quarrel seriously with us.

Among our approximate 400,000 deer, the sex ratio of adults varies between regions of the State depending upon the intensity of annual buck hunting. Thus in the southern part of the State below the north-south zone line, the deer herds are easily accessible because of the dense network of roads. In this large area the sex ratio averages about 100 bucks to 200-300 adult does—a direct result of high, annual buck hunting pressure. In the northern, Adirondack region, and particularly within the Adirondack Park "blue line," access to the deer herds is difficult. Roads are few, and only a comparatively few hunters venture back into these wilderness areas. Here the sex ratio of adult deer is about 100 bucks to 130 does.

How many fawns are born each year to this great herd of deer? We have found that this too varies by regions, and that aside from the obvious influence of the numbers of does, the kind, quality and amounts of natural deer food available have a profound influence on the birth rates. In the southern region as a whole 100 adult does will annually bear about 170 fawns, and adding to these will be another 30-40 fawns for every 100 yearling does which were bred when only seven or eight months old! In the northern region 100 adult does can be expected to produce about 120 fawns annually, and only rarely will a yearling doe add to this number. Thus from our herd of 400,000 deer we can expect each Spring and early Summer anywhere from 200,000-225,000 fawns to be born and vigilantly guarded. Since the largest proportion of our does mate in November and since the gestation period averages about 200 days, most of the fawns appear from mid-May to mid-June.

The *average* life-expectancy of deer is amazingly short. Since we have learned how to tell their age accurately from examining the stage of tooth-replacement and tooth wear, we are now able to construct a kind of actuarial table much as life insurance companies do when calculating their financial risks in insuring human lives. Though we don't insure our deer financially, we can insure them against facing too heavy odds from man's pursuit of them. This we do through regulating hunting seasons and bag limits, providing certain protections from dogs, and from good people who find it difficult to refrain from "saving" a supposedly abandoned fawn. We have found through analyzing data on thousands of deer that the average buck in the southern region has a life expectancy of 1.9 years, the average doe about 2.6 years. In the northern region the average buck can expect to live about 2.6 years, doe about three. It is unusual to find a buck older than five years in the southern counties, whereas it is not at all uncommon to find deer 10 years or older in the Adirondacks.

There used to be great concern about the effects of deer hunting on survival of our deer. As a matter of fact, the strict protective laws enacted near the turn of the century were largely instrumental in promoting the deer's re-establishment and spread throughout range suitable to it in southern New York. Here it was nearly exterminated in the 1800's, and was rare even in the Catskills. Extensive lumbering was also of vital importance in the resurgence of deer because new brush growth developed in its wake and provided an abundance of succulent food. For the same reason, lumbering is still an important factor affecting deer abundance. After all, it takes from six to eight pounds of good food *each day of the year* to nourish adequately the average deer. This is well over a ton per year, and considering the finicky eating habits of this fellow, one can see that the task shared by Mother Nature and Man—the provision of 400,000 to 600,000 tons of deer food each year—is not inconsiderable.

Due to the legal provisions requiring the reporting of each deer taken in the State, we have a reasonably accurate record of the impact of hunting seasons

Deer and agriculture: 23 deer seen from the air in the Lake Plains region

on deer in every county where hunting is permitted. For example, in 1928—with a 31-day season in the Adirondacks or northern region—there were 5,997 bucks reported. In the same year, during the 15-day season in the southern region when *all* counties were open, there were 1,050 bucks reported taken. Twenty-five years later (1953), with a 37-day season in the Adirondacks, there were 7,340 bucks reported; from the 26 counties west of the Catskills (six-day season) and 14 counties in the Catskill area (16-day season) the reported buck kill was 15,017. Then last Fall, with a season the same as in 1953, 7,778 bucks were reported from the Adirondacks, while from the south came reports of 25,161 bucks—14,017 from the 26 western counties which had a 12-day season, and 11,144 from the Catskill counties which had a 16-day season. Recapitulation: *1928*, Adirondacks 5,997, Southern 1,050; *1953*, Adirondacks 7,340, Southern 15,017; *1955*, Adirondacks 7,778, Southern 25,161.

From these figures it can be easily seen that our buck hunting carries no threat to survival of the State's burgeoning deer herds, in spite of the fact that hunting pressure on deer, in terms of licensed hunters, is more than ten times as heavy now as it was in 1928. As a matter of fact, since the deer is a polygamous animal, and considering the tremendous annual replenishment of fawns (birth ratio of 106 males to 100 females) it has now become evident that it is impossible to curtail growth of deer populations through buck hunting alone.

For this reason the Conservation Department declares special seasons at periodic intervals during which hunters may take a deer of either sex. This type of season was first introduced in Steuben County in 1941. It was brought about by acute, growing conflict between the rapidly expanding deer population in the southern counties and the economic interests of agriculturists. The simple fact was that there were too many deer—too many for *friendly* compatability with the farmer. The buck law had become outmoded—but it was hard to convince the great majority of the public who had been so completely sold on the immutability of the buck law as the one sound principle of deer conservation.

Winter Starvation

But what of deer populations where their conflict with agricultural interests are of much less significance? This brings us to another point which will be understood by all thoughtful students of living things:

Every animal or plant is a product of its environment. All of its requirements for life are there. Every species has its particular niche in the environment and this is called its habitat. But every habitat or niche has limitations in its capacity to support populations of any given species. This limit is known to wildlife biologists as maximum carrying capacity, and it is the tendency of every species to grow in numbers beyond that carrying capacity. In the case of deer, particularly in the northern states and Canada, the big, natural control affecting maximum carrying capacity of deer habitat is the wintering range where they tend to concentrate for shelter and food.

In the Adirondacks and in parts of the Catskills, cold weather and accumulations of snow cause deer to concentrate in large numbers. Deep snow may result in their being so confined that movement is limited only to a network of trails. Being unable to leave these trails, their food is restricted to what they can reach from the trail side or by standing on their hind legs and stretching to reach the overhanging boughs. Low food plants are covered by snow.

Deer trails in deep snow in north woods showing heavily over-browsed food plants in trail network

This wintering range may consist of only 10 to 20 per cent of the total area over which they feed and rest during the remainder of the year. But the qualitative as well as quantitative limits of food in this restricted wintering area is the major condition influencing and even con-

trolling deer abundance throughout the animal's total Summer and Fall range. Starvation may become the great leveler, and the overburdened Winter food plants, annually browsed back by hungry deer, have little chance for recovery. The surviving deer are in poor condition come Spring. Antler development of the yearling bucks is of generally poor quality, the does produce fewer fawns, and fawn growth is retarded. The result is a decadent population struggling to survive on a subsistence diet with little hope of improvement.

Too many deer? Yes. And the trouble is that as this situation developed, leading to deterioration of the natural range, few of man's economic toes, particularly in the north country, were being stepped on—so there was no outcry and no general move to correct the situation. The landowners' interests were not controlling.

Most of our experience with Winter starvation of deer has come from the Adirondacks. But this past Winter, with its heavy, late snowfalls, unusual hardship came to deer which habitually concentrate on south-facing slopes in south central and western Catskill counties.

One of the many areas affected was a 22-mile stretch of the Chenango River Valley between Norwich and Greene. It became a theatre for humanitarian response to starving deer caught in the deep snow covering the open slopes. Potatoes, hay, grains, horse feed, and even stale bakery products were freely donated and freely distributed to the deer by volunteers from many conservation groups of the region and by residents of the valley communities. More important, many organized browse-cutting expeditions labored to bring the more natural food of deer—hardwood browse—within reach of the animals. Such browse was heavily, almost completely, utilized.

Department men surveyed losses in this valley and found that fawns comprised over 90 per cent of the dead deer found. They estimated that about 400 deer died from starvation in this stretch of the Chenango Valley. These may have represented 10 per cent (or slightly more) of the deer occupying these valley slopes during the Winter.

Dogs running at large contributed to deer deaths through harassment of the animals, and also in outright kills. This was a particularly deplorable situation and aroused many bitter feelings, yet it is of common occurrence in southern counties when deer movement is handicapped by deep snow, and particularly in areas near thickly settled communities.

WHAT have we learned from the experiences of this past Winter? In the first place, we learned that in spite of a record hunting take of around 5,800 deer from Chenango County this past Fall (including both bucks and does) the Winter brought out into full view thousands of deer. Many of the smaller fawns could not compete successfully for the short rations, and even a few adult deer died.

A fawn in the last stage of Winter starvation

Further, the ineffectiveness of feeding meadow hay and potatoes to these deer was clearly demonstrated—in contrast to their avid use of the browse cuttings. The deer clearly preferred the type of foods to which they were accustomed and which their digestive systems could efficiently utilize. Though grains and horse feed were well used as foods, hay more frequently served as bedding.

These same slopes will be occupied again next year, even with a normal pattern of snowfall. But next year there will be less natural food for these deer because of forage depletion this past Winter. Deer may again starve—perhaps in the same counties as last Winter, perhaps in others—depending on the regional pattern of snowfall and the forage conditions in relation to deer populations.

Knowing all this, what can we do? The answer is not easy. Better organized and more systematic deer harvests are needed in the whole southern region, and attention must also be given to deer range improvement work, particularly on timber stands adjacent to deer wintering areas, and in providing improved pasturage on upper slopes used by wintering deer. Farmers are particularly concerned in these problems, which not only involve relations already strained with deer hunters, but also pocketbooks; it is the farmer who provides pasturage and browse for deer wintering on his property.

In our attempts to solve the many problems attendant to deer management, certainly the partnership approach is the most acceptable one. This partnership must include full representation of the farmer whose land supports the deer, as well as the hunter upon whom we must depend for harvesting surplus deer. With the representatives of both sportsmen and farmers, we are working right now to perfect such a partnership.

But the most difficult of all questions to resolve is that of how best to control the size of deer herds, whether in the northern or southern part of our State. A prerequisite to a sound solution to this major question is clear thinking based on known facts—and not sentiment. Our deer range in many sections is in danger, but the ears are few indeed which are tuned to hear and understand the dumb, silent protests of those deer herds which are approaching the brink of range disaster. Strong, convincing leadership will be required to preserve those ranges.

Our deer constitute a natural resource of very great importance. Our problem is to use this resource wisely—to avoid wasting it, and above all to protect and perpetuate the environment of which it is a product.

—E. L. CHEATUM,
Chief, Bureau of Game

Reforestation in Norway

EDITOR'S NOTE: We present here some excerpts from an article appearing recently in News of Norway, *published by the Norwegian Information Service at Washington. This was made available to us by the Editor, Andrew Moursund, who suggested that the forestry material might be of interest to readers of* THE CONSERVATIONIST.

In order to interpret some of the figures in terms of what we know about our State, it may be mentioned that Norway has a land area of 119,000 sq. mi. compared with 47,000 for New York. Also, we have inserted New York production figures parenthetically at several points in the text. Another thing to remember with respect to the extensive acreage planted is that Northern Europe (as well as some parts of North America) depend to a much greater extent on artificial reforestation as a means of timber production than is the case in the Northeastern United States. With us, reforestation is a valuable means of converting rundown farm lands to forest cover and these plantations may be expected to produce pulpwood, softwood timber, or short term crops like posts and Christmas trees; but they will never constitute more than a supplement to the timber resource developed from the native timber tracts, which will regenerate themselves satisfactorily under proper forest management.

THE week-long Agricultural Conference, recently held in Oslo, spotlighted the significant progress made in the comprehensive program for planting new woods in the coastal districts of western Norway. Research Director Anton Smitt told the farm leaders that reforestation was destined to change the whole structure of the four western provinces. Forestry, he declared, will surely become the most important pillar of the regional economy.

Norway has nearly 19 million acres of forest land (New York has 14½), covering almost a fourth of the total area. The bulk is coniferous—about 15 million acres, but there are also some 4 million acres of hardwood, mainly birch. The annual tree felling, averaging about 235 million cubic feet of commercial timber plus a substantial volume of cordwood, corresponds closely to the yearly growth. (New York cuts 140 million, grows 393.)

With the growing need for commercial timber to supply raw material for the important wood-processing industry, concerted efforts have been made to increase timber production, and with very considerable success. Through better forest management, subsidized drainage of bogland, intensive research, and extensive reforestation, authorities believe it is possible to boost the production by some 50 per cent. As an integral part of the program, the state has established a number of tree nurseries and seed drying centers. Altogether 65 million seedlings were planted last year in all parts of the country, as compared with some 55 million in 1953. (New York is currently raising about 30 million.)

The possibility of turning the coastal districts into valuable woodland has been realized for a long time. These areas have little coniferous woodland, but a lot of relatively worthless hardwood. Moreover, there are vast stretches of barren land, of which a good deal is suitable for producing pine and spruce. A few enthusiasts began tree planting a hundred years ago, but made very slow progress. After establishment of the Norwegian Forestry Society in 1898, the momentum began to pick up. The planting continued to be rather scattered, however, and the species selected were in part unsuited for the coastal conditions. Moreover, the seedlings were planted too close for healthy growth. From the time reforestation was started to 1950, an area of some 62,000 acres had been effectively planted.

In the period 1930 to 1950, annual planting in the coastal districts totaled only 8 to 10 million seedlings. In 1951, the number increased suddenly to about 15 million. And last year, over 35 million young trees were planted along the Norwegian coast. The notable upspurt followed shortly after Orsta County, in the western Province of More and Romsdal, had pioneered the development of municipal reforestation plans. In 1952, the Forestry Directorate issued an important policy directive on reforestation in coastal districts which, for the first time, offered a state subsidy to help pay the salary of municipal reforestation leaders. Their job would be to promote local reforestation, in consultation with the respective County Foresters. The latter work under the Provincial Forester who, in turn, is the regional representative of the Director of Forestry. Many of the counties now plant a larger area in a single year than they did in the entire 50-year period 1900-1950. By planting ever larger numbers of seedlings and by placing them wider apart, the annual area has been increased from less than 6,000 acres in 1950 to well over 20,000 acres last year.

The target for the west Norway reforestation program, as recommended by the Forestry Commission of 1951 in a report to Parliament, calls for planting a total of 900,000 acres, including some 500,000 acres of barren land over a period of 60 years, or an average of some 15,000 acres annually. For the central Trondelag districts, the goal has been limited to 75,000 acres over the same number of years, averaging about 1,250 acres per year. A 60-year plan for reforesting the three northernmost Provinces of Nordland, Troms and Finnmark, worked out by the Directorate of Forestry in 1951, calls for planting a total area of about 250,000 acres, with an annual average of 4,500 acres.

The eggs, laid in late October are carried attached to the abdomen

Raising Crayfish for Bait

by John Forney, *Research Assistant, Cornell University*

CRAYISH, crawfish, crawdads or crabs—as they are variously known—are widely distributed in New York's streams, lakes and marshes. While they serve as an important natural forage for game fish, they are also a very desirable bait for Summer fishing, and each year more fishermen are using more crayfish, with the result that bait dealers are finding the supply in local lakes and marshes inadequate to meet the current demand.

Some bait dealers have solved the problem of short supply by raising crayfish in artificial ponds, and additional pond owners and bait dealers may find it profitable to follow their lead. It is the purpose of this article to furnish some information which may be helpful to them.

Species to raise

A recent study of crayfish distribution and taxonomy disclosed that at least eight species inhabit New York's waters. Although these eight are quite similar in appearance, each species seems to have its own particular habitat preferences or requirements. Certain species are most abundant in swift streams, others in sluggish rivers, and some are abundant only in lakes and ponds. In New York, the most common (and frequently the only kind of crayfish in ponds and marshes with a mud bottom) has the scientific name *Orconectes i. immunis*, and is often called a "grass-crab" or "paper-shell crab" by bait dealers because the shell is relatively thin. *This crayfish is the only New York species recommended for pond culture.*

Since it is difficult to identify the different species of crayfish, breeding stock for new ponds should be obtained from bait producers who have crayfish ponds in production. If reliance must be placed upon a supply from natural waters, the breeders should be collected from a marsh or pond with a mud bottom.

Life history

Whether raising crayfish, fish or livestock, maximum production can only be achieved when the animal's life history and requirements are known. The complicated life story of the paper-shell crayfish has been described by Dr. Peter Tack, formerly a graduate student at Cornell.

This crayfish generally becomes sexually mature in its second Summer of life. Mating, which occurs between July and September, consists of a transfer of sperm from the male to a receptacle in the abdomen of the female where the sperm is stored. By mid-October most of the females have retired into burrows dug into the pond bottom. Here the eggs are deposited late in October or early in November.

The process of egg laying begins with a careful scrubbing of the abdomen with the legs. When the abdomen is free of foreign material, a sticky cement-like substance (glair) is extruded from glands located on the underside of the abdomen. Simultaneously, sperm stored in the abdominal receptacle is released into the glair. Then the female, while lying on her back, releases the eggs from the ovaries. The eggs become dispersed through the glair where they are fertilized and become securely cemented to the abdominal legs. The female is then said to be "in berry."

The female crayfish, depending on her size, will carry from 60 to 300 eggs through the Winter. The eggs usually hatch in May. Newly hatched crayfish cling to the female for one or two weeks before wandering off to assume an independent life.

In ponds there is considerable individual variation in growth rate. Some crayfish hatched in May will reach bait size by July 1st. Others in the same pond may not attain saleable size until September. Young crayfish which reach a length of two inches by Fall may become sexually mature at this time. Thus a few females usually lay eggs five months after hatching, although the majority of the young will not reach sexual maturity until their second Summer.

The crayfish grows by periodically discarding its hard, rigid shell and forming a new one. This process (called molting) may occur eight or more times in the first year of life. For a short period after the old shell has been discarded, the new shell is very soft and pliable, and during this period an increase in size occurs. While in the "soft" stage following molting, crayfish bring a premium price as bait.

Crayfish have a short life span. Most males die at the end of their second Summer of life and females at the beginning of their third Summer. Dead and dying male crayfish will frequently be noticed in August and September and some dead females are usually seen in May. Old age, rather than disease, is usually the cause of death.

Management

Crayfish have been raised in farm ponds and similar impoundments with surface areas ranging from 1/30th to 5 acres. Ponds under ½ acre in area are easiest to seine and manage. Farm ponds are generally constructed with a maximum depth of 6 to 10 feet, but while this depth of water is required to assure fish an adequate supply of oxygen during periods of ice cover, shallower ponds can

be used for crayfish production; in fact, ponds with a depth of only two feet have produced an excellent crop. A dependable water supply, however, is necessary to maintain the water level in shallow ponds.

The bait pond should be stocked in the Fall with 600 to 1,000 mature crayfish per acre. Crayfish with a body length of 2½ inches are sexually mature, and females will lay their eggs soon after they are stocked. If stocking is delayed until Spring, female crayfish "in berry" should be stocked at a rate of 300 to 500 per acre.

Contrary to popular belief, it is not necessary to have luxuriant growth of submerged vegetation in these ponds. Although crayfish do feed on rooted aquatic plants when these are available, in ponds they appear to survive and grow equally well on a diet of microscopic plants and animals. Fertilization of the pond will greatly increase the abundance of such microscopic plants and may also stimulate the growth of rooted plants. Commercial fertilizer mixtures such as 6-12-6 and 10-10-5 can be applied by broadcasting from shore over the pond surface. Application of 200 pounds per acre at three-week intervals during the Spring and Summer are recommended. Or 20 to 30 bushels of manure per acre may be applied to ponds at three-week intervals in place of commercial fertilizer.

The yield of crayfish from several fertilized New York bait ponds illustrates the production which can be achieved:

Pond Number	Surface Acres	Yield Per Acre Numbers	Pounds
1	0.14	22,500	89
2	0.20	38,600	330
3	0.22	63,100	352
4	0.25	28,700	288

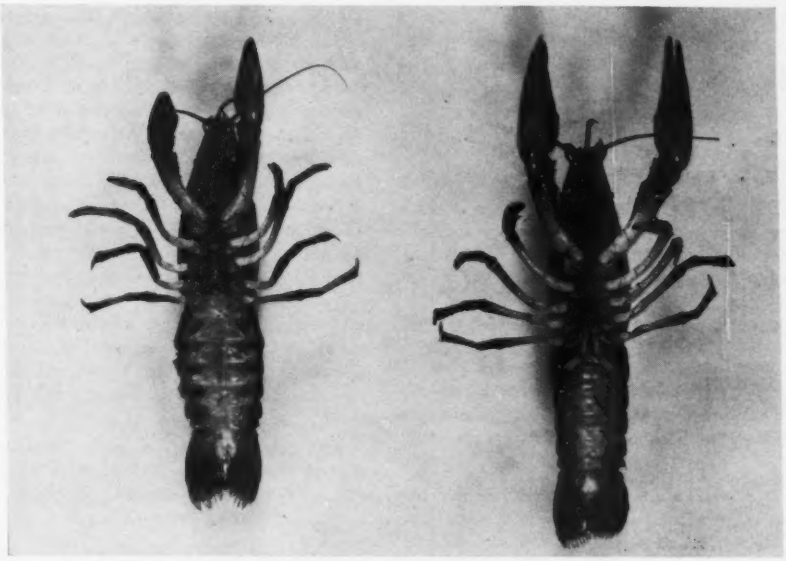
Most of the crayfish removed from these ponds were young of the current year. The yearlings remain in their burrows during the day time and are seldom captured when ponds are seined; thus there is no danger of depleting the breeding stock once a good population has been established.

Feeding may be used to supplement the natural food supply produced by fertilization. Soybean meal, fish meal, cracked corn and potatoes are some of the supplemental feeds which have been used. And cut hay, either fresh or dried, is a very inexpensive feed which may have considerable value. In a test at the Cornell University Fish Hatchery 48,000 crayfish per acre, weighing 340 pounds, were produced in a pond where 1½ tons of hay were applied in combination with 400 pounds of superphosphate per acre. The same pond the following year produced only 10,000 crayfish per acre, weighing 96 pounds, when only superphosphate was applied.

Minnows are frequently stocked with crayfish for a double bait dividend, and excellent crops of golden shiners, suckers and fathead minnows have been raised with crayfish. However, such a combination has certain disadvantages. Each time the pond is seined crayfish and fish must be separated by hand and many minnows are injured or killed in the process. The bait producer who is primarily interested in raising minnows may find that crayfish in his ponds are more of a nuisance than an asset. While crayfish can be raised in combination with minnows, the presence of game or pan fish in a bait pond seriously lowers the yield of crayfish.

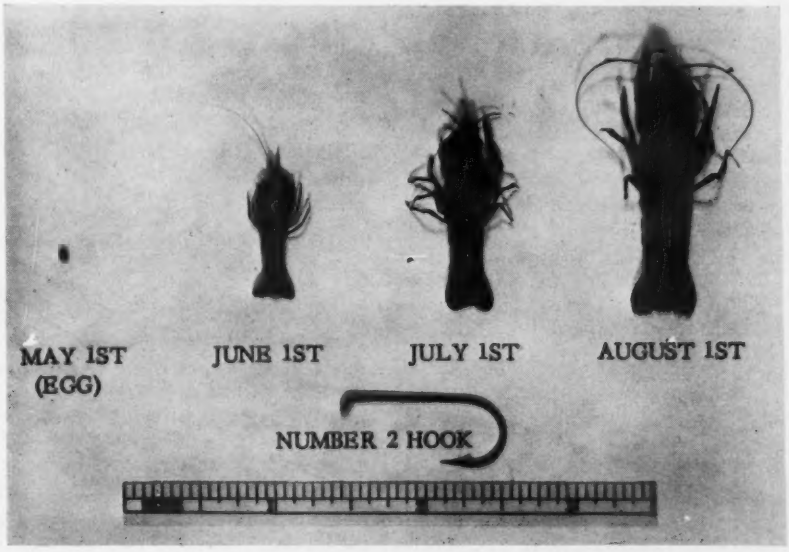
Pond propagation of crayfish is a practical way of meeting the increasing demands of fishermen for good bait, and the established bait dealer will find such a pond useful in supplementing his present supply. Often the production of crayfish in ponds is less expensive than seining in natural waters.

Large scale rearing of crayfish may be practical in some areas of New York State. However, before undertaking such a venture, the local markets and prices should be studied and experience gained in operating a small group of ponds.



Male crayfish (right) can be identified by the modified first pair of abdominal legs used to transfer sperm to seminal receptacle of female (left), situated between fourth and fifth pair of walking legs

Young crayfish hatched in May often grow to bait size by July



Paradise at Paradox

by **D. L. Collins,*** ***State Entomologist, New York, State Museum and Science Service, State Education Department, and C. J. Yops, Superintendent of Forest Pest Control, Division of Lands and Forests, New York State Conservation Department***

The fisherman on the cover of this issue may or may not be going to catch a trout. But one thing is certain: Blackflies are giving him a lot of trouble, or he wouldn't have bothered to wrap himself up the way he did.

Long before Winslow Homer painted this picture, and ever since, the blackfly has been a controlling factor not only in the enjoyment (or lack of it) of early Summer in the Adirondacks, but also a profound influence on the economics of the entire North Country region: If the blackflies are there, people aren't.

As indicated in the article that follows, it has been demonstrated that the controlled use of DDT at proper dosage levels will give effective control of blackflies in limited areas.

We should like to emphasize, however, that DDT is toxic to animals—especially to fish and to the insects which are used by fish for food—if the dosage is large enough. The use of more than the recommended amount of DDT, or the promiscuous or careless use of this chemical, is likely to kill fish (which incidentally is a violation of the Conservation Law) and may seriously damage fish production in the treated waters.

The use of DDT for black fly control should be limited, therefore, to carefully planned and executed treatment programs. For professionals, not amateurs.

FOR a fugitive from blackflies to refer to Paradox as a paradise is a paradox, at least to old timers—and to some not-so-old timers as well—in the region north of Schroon Lake. Nevertheless, that is just what it seemed to be to many visitors to Paradox Lake during the Spring and Summer of 1955. The blackfly control demonstration carried out by the Conservation Department, with the Public Campsite at Paradox Lake as the center of a 50 square-mile control area, for most people amply confirmed the hopes that advance publicity had aroused.

In THE CONSERVATIONIST for June-July, 1955 there were two articles on blackflies, one a description of blackfly control methods developed by the State Science Service, and the other a mention of a control demonstration, using those methods, to be made around the State Public Campsite at Paradox Lake in Essex County. Considerable interest in the possibility of blackfly control in limited areas was aroused by these articles, and the following account of the Paradox operation and its results has therefore been prepared. It should be emphasized that it was not—and is not—the intention of the State to use the information gained as the basis for the promotion of new blackfly control programs; rather, the experiment was undertaken merely to test the feasibility of such programs.

SINCE the larvae of blackflies live only in swiftly flowing streams, and since the control program at Paradox was designed to eliminate the larvae, the first step was a stream survey to determine what species were present and where they were most abundant. To most persons, blackflies are all alike and *any* blackfly is a potential biter. But we have found that there are 23 or more different species of blackfly in New York, with significant differences in life history and habits, and that only two (or possibly three) of the species are annoying biters. In planning and evaluating a control program, therefore, it is important to know just what species are abundant, and to concentrate on eliminating those that bite most fiercely and most frequently.

The first stream survey, made on April 15, 1955 before any treatment, showed that the principal early Spring biting species *(Prosimulium hirtipes* Fries) occurred rather generally in suitable streams throughout the area. Later surveys revealed that the second biting species, *Simulium venustum* Say, was also abundant.

The acreage included in the Paradox control program is shown on the map. This area was between 7½ and 8 miles on a side, comprising about 37,000 acres (58 square miles) with Paradox Campsite roughly at the center. The plans called for two complete airplane sprays following a regular swath pattern; one spray for the early species, *Prosimulium hirtipes,* one for the later species, *Simulium venustum;* and one topical spray over streams where development of the second nuisance species *Simulium venustum* was expected to be early owing to higher water temperatures in sections below shallow flows and lakes. Selected check points in the streams were examined at approximately weekly intervals to determine (1) whether the treatments were effective, (2) when the second species reached the point where the next spray should be applied, and (3) to ascertain what effect the treatments had on other animals, (e.g., fish and fish-food insects) in the streams.

The following details will afford an idea of how the program was carried out, and how it was evaluated. (Reference is again made to the map.)

Equipment used: State-owned Stearman 'plane equipped with 30-foot boom and 2 nozzles.

Area covered: A square plot 7.5 to 8 miles on a side, comprising about 37,000 acres.

Technique: A regular swath pattern with parallel swaths ¼ mile apart, with topical touch-up applications where needed in difficult spots.

Material: Approximately 20 per cent DDT solution, i.e., 2 pounds of DDT in each gallon of solvent.

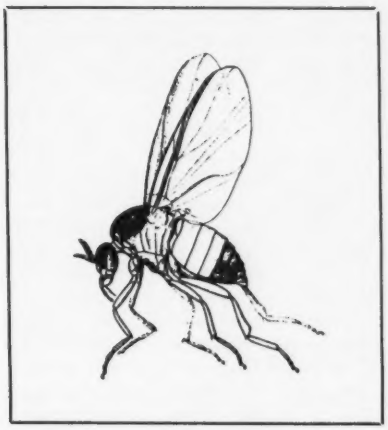
Solvent: Sovacide F.

Dosage: One gallon of solution (2 pounds of DDT) per flight mile.

Number of sprays: Two complete coverages, the first on April 20 for the early Spring species, *(Prosimulium hirtipes)* and the second on June 16 for the later species *(Simulium venustum),* with a partial (topical) coverage of warmer streams on May 16 to kill early developing *S. venustum.*

Other information: Each complete coverage took from 4½ to 6½ hours of flying time.

* Published by permission of the Director, New York State Museum and Science Service.



The blackfly—pest supreme and bane of the existence of the hunter, hiker, fisherman and resort owner—is beginning to lose his nuisance value as spray control methods hit him where he lives.

It is of interest to note that the actual dosage per acre on the basis of total acreage under control is almost unbelievably small. Thus, one gallon of DDT solution containing 2 lbs. of DDT discharged at the rate of 1 gallon per flight mile, with only 4 swaths, each a mile long over a square mile, would actually give a dosage of 4 gallons of solution or 8 pounds of DDT per square mile. Since there are 640 acres in a square mile, the dosage as commonly expressed would be only 0.006 gallon (three-quarters of an ounce) of solution, or 0.01 pound (about one-sixth of an ounce) of DDT per acre.

Observations at the selected checkpoints and other points in streams were made before and after each spray, and at weekly or 10-day intervals throughout May and June. C. J. Kolodzey, of the Conservation Department, made frequent additional observations on the larvae and other organisms in the streams, and on the presence, absence, or relative abundance of adult flies, both inside and outside the control area.

Identifications of the larvae collected were made or confirmed by Dr. Hugo Jamnback of the State Museum and Science Service. The spray 'plane was flown by Robert D. Mason, Jr. of the Conservation Department. William W. Masterson was in general charge of the field operations for the Conservation Department.

As was mentioned above, blackfly larvae, including the pestiferous *P. hirtipes*, were found before the first spray on April 20. To cite one or two typical examples, on April 15, at check points in Paragon Brook and Letson Pond outlet, blackfly larvae were extremely numerous, up to more than 50 larvae "per attachment unit." An "attachment unit" was a stone, stick, blade of grass or other object to which blackfly larvae commonly attach. Before spraying, populations of 10,000 larvae per square foot in certain stretches of each stream were considered a conservative estimate.

On April 23, three days after spraying, larvae at Letson Pond outlet and several other streams checked had virtually disappeared. However, in Paragon Brook the population had not declined to the same extent. A comparison of the spray swath pattern with the position of the stream showed that about half a mile above the check point it flowed out of a swamp at least a mile long, and then parallel to and halfway between two spray swaths. Another branch of the brook had been dammed to form Eagle Lake.

Under these conditions, not only might the stream escape the full treatment, but the spray that did fall into it might float to the edges of the quiet, ponded portion, or settle out or be held in contact with surface vegetation, and therefore not reach the blackfly larvae on dams or below other stretches of quiet water. A certain volume of 20 per cent DDT solution was released drop by drop from a medicine dropper over a period of 20 minutes a few feet above the Eagle Lake dam. This procedure was successful for the greater portion of the stream, but did not dislodge all of the larvae at the dam because it did not mix thoroughly enough before going over. Therefore, even though most of the larvae at the dam proved to be *Simulium vittatum* and *S. dacotense* (species of little or no importance as regards biting), a modification of this method was tried; namely, the addition of an emulsifier to the solution. Using this emulsion concentrate, the drop by drop release was effective, and also proved successful at the dam below Pyramid Lake, another difficult site.

The dropper method of releasing insecticide over an extended time period was used in order to insure thorough mixing in a large volume of water. The amount released is based on the volume and flow of the stream. This results in a dilution that is safe for fish and most of the bottom fauna which comprise fish food, but is strong enough to affect the blackfly larvae, which are *on top* of the stones and appear to have much less resistance to insecticides than other stream-inhabiting insects, most of which are on the bottom or under stones.

This is a good place to mention the fact that in the periodic stream surveys at the various check points, there appeared to be little or no reduction in such bottom fauna as mayfly nymphs, stonefly nymphs and the like, regarded as important fish food items, and in no instance was there any indication of any adverse effects on fish or other wildlife. (A detailed treatment of this and related subjects is given in N. Y. State Museum Bulletin No. 350, "The Control of Blackflies in New York," by H. Jamnback and D. L. Collins.)

By May 16 a few of the streams, especially at points immediately below large expanses of shallow water—such as swampy areas or ponds—had warmed up sufficiently to allow the second principal biting variety of blackfly *(S. venustum)* to develop from the egg stage (in which it had overwintered) into larvae large enough to be seen. Therefore, it was considered best to spray these "early areas" in advance of the general second spray of the entire area. The sites to be sprayed were selected from topographic maps on the basis of similarity to known sites where *S. venustum* was at the right stage.

This topical spraying was done on May 16, and succeeded in reducing the emergence of early *venustum* to a minimum, with the result that the final complete spray could be postponed until June 16. Since *venustum* was not developing in large numbers at the dams where routine air treatments do not always succeed, it was not necessary to make late treatments from the ground for this species. Instead, as a precaution, additional passes of the spray 'plane were made over those spots where the routine swath pattern used for the earlier spray had not achieved the desired results.

So much for the actual operations, and their observable results in the streams. But what of the ultimate objective of the work, reduction of the blackfly nuisance? Were there actually fewer flies on the wing and biting during blackfly time?

It is difficult to give statistical evidence in answer to such a question, but the statistics available, plus the opinions of qualified observers, all indicate that the Paradox area was remarkably free of blackflies during the Spring and Summer of 1955. Since adjacent areas had many flies, and since Paradox up until the past season had always had them, the conclusion was reached that the control measures must have worked. Interviews with campers and visitors, as well as with owners of business establishments in the Paradox Lake section, confirmed this conclusion:

• On May 26, a family living near the center of the area agreed that there had been "almost no blackflies this year . . . a very great improvement over other years."

• On May 21, members of a State Highway Repair crew operating in the area were interviewed, and all agreed that there was "no comparison" between the blackfly nuisance this past year and that of previous years.

• On June 9 several persons at Clautice's Tavern, near the center of the control area, commented enthusiastically on the absence of blackflies, and mentioned what a contrast it was with neighboring sections and with the same location in previous years.

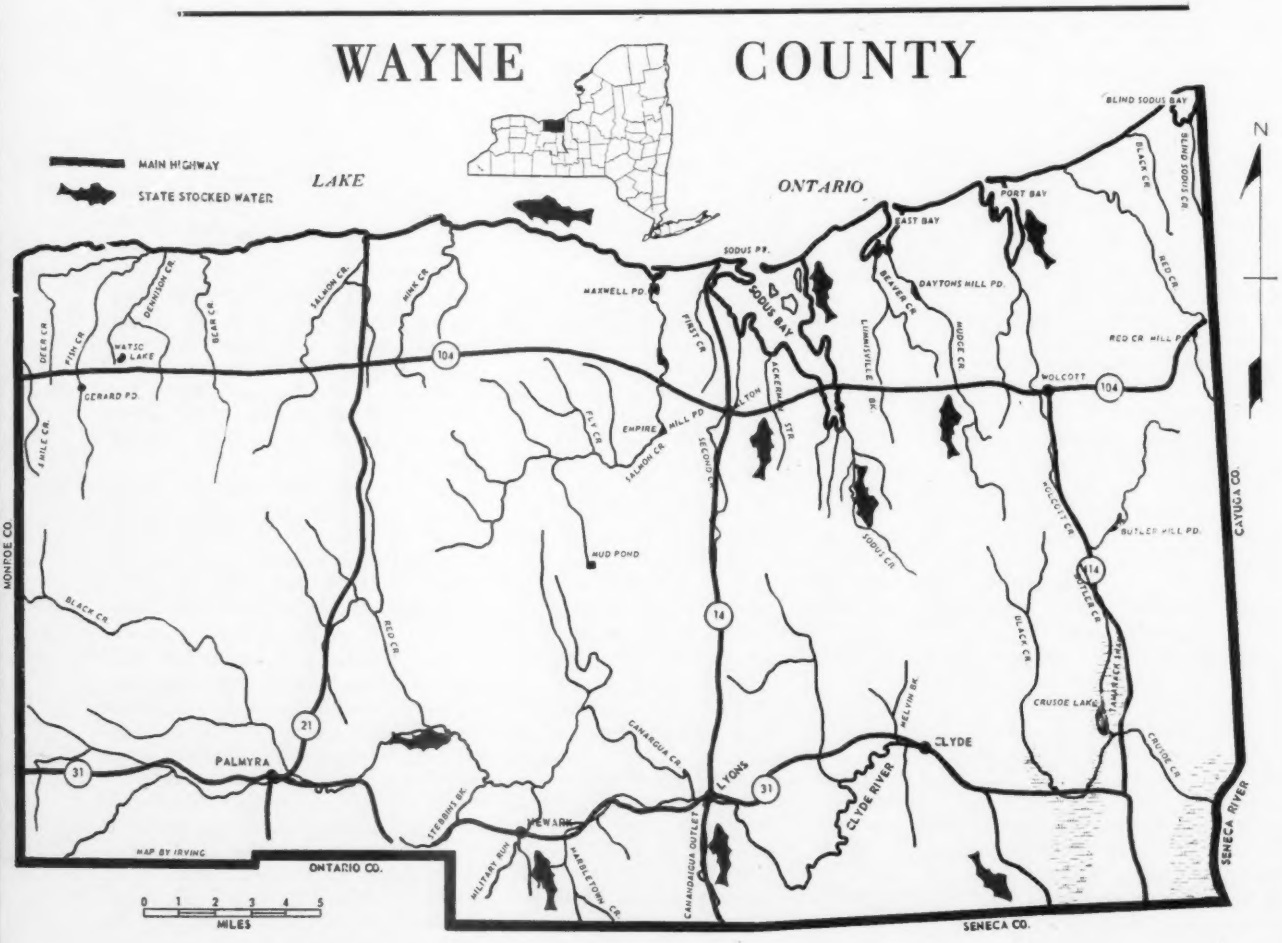
• The owner of a camp on the north side of the lake, near Johnson Pond outlet, said that he went fishing there over Memorial Day and for the first time did not have to use any "fly dope." The following week "there were still no blackflies."

• A family at Paradox Post Office (who remained at their home the year around) stated that they "never saw it so fine as to the blackfly situation," and estimated that the blackfly population was "90 per cent less, to nil" during May and June.

• The caretaker of a camp at Severance stated "it has never been so fine as this year"; that he and his workmen often commented on the absence of blackflies. One of the workmen, a local man from Crown Point, had had many years of experience in the area, both in State and Federal forest work and in private camps. His work took him from Lake Champlain to Newcomb. His comment was that fly conditions were "absolutely fine in the Paradox area—scarce to none."

The story was the same from Forest Rangers, whose work took them in and out of the central area at various points almost daily; and from all others who were interviewed. At the same time, within five miles of the edge of the control area, flies were extremely numerous, and cases where persons had suffered severely from their bites were reported.

These experiences and comments are cited here because—together with the more tangible observations on the clearing of the larvae from the streams—they all add up to one conclusion: As one resident put it, that "something must have happened to the blackflies" in the Paradox area. All evidence indicates that this "something" was the air spray program.



N. Y. S. Conservation Department Offices

District Forester	5 E. Steuben St., Bath
District Game Manager	2130 Scottsville Rd., Scottsville
District Fisheries Manager	2130 Scottsville Rd., Scottsville
District Game Protector	2130 Scottsville Rd., Scottsville

Farm Service Offices

Wayne Co. Soil Conservation District	2 E. Main St., Sodus
Wayne Co. Agricultural Agent	Extension Service, Alton

Note: Sodus Bay is the location of the only known occurrence of Yellow Lotus as a wild plant in New York.—ROY IRVING

Conservation Library

Part 3

Books on Herbs and Grasses

Part 1 appeared in our February-March 1956 issue, and dealt with books on animals. Part 2, dealing with books on woody plants, appeared in our April-May number. In future issues we will cover books on non-woody plants other than those described here, and on minerals, soils, natural resource management, and general conservation.

Reading Guide: *Charts show recommending authorities across the top; books they recommend in left column. Asterisks show specific recommendations of the individual authorities. Digests which follow give source and briefly outline contents of each book listed.*

The Pocket Guide to the Wild Flowers, How to Identify and Enjoy Them: (1951) by Samuel Gottscho; Dodd, Mead, New York. An attractive book with several species of flowers arranged as to seasons; illustrated—some in color and some in black and white.

Wild Flowers of New York: (1923) N.Y.S. Museum Memoir 15. 2 Vols. By Homer D. House, N.Y.S. Museum, Albany, N. Y. Good basic reference with many excellent color and some black and white photographs. Most identifications must be made by comparing plant with picture. Keys help on more difficult groups such as asters. Out of print but in many libraries and some rare book stores. Prints of color plates (only) available from Museum.

Gray's Manual of Botany: (1950) Eighth (Centennial) Edition. A Handbook of the Flowering Plants and Ferns of the Central and Northeastern U. S. and Adjacent Canada. Merritt L. Fernald, American Book Company, New York. For more than a hundred years and through its eight editions this has been the standard reference work on flora of northeast. More than 1,500 pages, a few line drawings of critical parts of some species. Good glossary of terms.

The New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada: 3 Vols. (1952) New York Botanical Garden, New York. Good reference for amateur and professional. Black and white line drawings help beginner in use of keys. Good introduction.

Flowers. A Guide to Familiar American Wildflowers: (1950) by H. S. Zimm and A. C. Martin, Simon and Schuster, New York. 134 illustrations in color of wildflowers with range maps of one presented. Good reference for beginners.

Wild Flower Guide, Northeastern and Midland United States: (1948) by Edgar T. Wherry. Doubleday and Co., Inc., Garden City, N. Y. Black and white and color illustrations, simple keys, brief descriptions and discussion of features, range, habitat, culture and notes make this an informative and enjoyable book for the beginner.

F. Schuyler Mathews Field Book of American Wild Flowers: (1955) Revised and edited by Norman Taylor. G. P. Putnam's Sons, New York. Good field book since first edition in 1902. 30 color plates and more than 300 black and white illustrations. Emphasis on color as guide.

(Continued on next page)

	*Banks	*Ogden	*Morrison	*S. Smith	*Edminster	*R. Smith
THE POCKET GUIDE TO THE WILD FLOWERS *Samuel Gottscho*	☆					
WILD FLOWERS OF NEW YORK *Homer House (2 Vols.)*	☆	☆	☆	☆		☆
GRAY'S MANUAL OF BOTANY *M. L. Fernald (8th ed.)*	☆	☆	☆	☆	☆	☆
NEW BRITTON AND BROWN ILLUSTRATED FLORA *H. A. Gleason (3 Vols.)*	☆	☆	☆	☆		☆
A GUIDE TO FAMILIAR AMERICAN WILDFLOWERS *H. S. Zim and A. C. Martin*			☆			
WILD FLOWER GUIDE *Edgar T. Wherry*		☆	☆			
MATHEWS FIELD BOOK OF AMERICAN WILD FLOWERS *Edited by Norman Taylor*		☆	☆	☆		
MANUAL OF THE GRASSES OF THE U. S. *A. S. Hitchcock*		☆		☆	☆	☆
GRASS, 1948 YEARBOOK OF AGRICULTURE *U. S. Dept. of Agriculture*		☆			☆	☆
WEEDS *W. C. Muenscher*		☆		☆		☆
WEED SEEDLINGS *A. P. Kummer*		☆				
AMERICAN WILDLIFE AND PLANTS *A. C. Martin, H. S. Zim and A. L. Nelson*					☆	☆
POISONOUS PLANTS OF THE U. S. *W. C. Muenscher*				☆		☆
BEGINNERS GUIDE TO WILD FLOWERS *E. H. Hausman*		☆				
PLANTS OF THE VICINITY OF NEW YORK *H. A. Gleason*		☆				
ANNOTATED LIST OF THE FERNS AND FLOWERING PLANTS OF N. Y. STATE *H. D. House*		☆				
FIELD BOOK OF NATURAL HISTORY *E. Laurence Palmer*		☆			☆	
PLANT FAMILIES - HOW TO KNOW THEM *H. E. Jaques*		☆				
MANUAL OF CULTIVATED PLANTS *L. H. Bailey*		☆		☆		
EDIBLE WILD PLANTS OF EASTERN NORTH AMERICA *M. L. Fernald and A. C. Kinsey*		☆		☆		
HOW TO KNOW THE GRASSES *R. W. Pohl*		☆		☆		
WILD FLOWERS OF WESTERN PENNSYLVANIA AND THE UPPER OHIO BASIN *O. E. Jennings*				☆		

DR. HARLAN P. BANKS, Head, Department of Botany, N. Y. S. College of Agriculture, Cornell University. DR. EUGENE C. OGDEN, State Botanist, N. Y. S. Museum. DR. JOHN MORRISON, Department of Forest Botany, N. Y. S. College of Forestry, Syracuse University. DR. STANLEY SMITH, Curator of Botany, N. Y. S. Museum. DR. FRANK EDMINSTER, State Conservationist, U.S. Department of Agriculture, Soil Conservation Service. RALPH SMITH, Game Research Investigator, N. Y. S. Conservation Department.

Manual of the Grasses of the United States: 2nd edition (1950) by A. S. Hitchcock (revised by Agnes Chase). U. S. Dept. of Agriculture, U. S. Govt. Printing Office, Washington, D. C. Descriptions, numerous line drawings, maps of distribution by states of all the grasses known to grow in the U. S. Technical.

Grass, Yearbook of Agriculture: (1948) U. S. Dept. of Agriculture, Superintendent of Documents, Washington 25, D. C. The grasses and associated legumes for hay crops, pasture, soil conservation and lawns. Includes popular descriptions and line drawings of the principal grasses and legumes for farm and home. Lists of suggested reading with each chapter.

Weeds: (1955) by Walter C. Muenscher; Macmillan Company, New York. Descriptions, diagnostic keys, line drawings, discussion of undesirable characteristics and control methods of weeds in the northern United States and Canada. Semi-technical. Bibliography.

Weed Seedlings: (1951) by Anna P. Kummer; University of Chicago Press, Chicago. Line drawings, descriptions and keys for the rapid identification of 300 kinds of weed seedlings. Technical.

American Wildlife and Plants: (1951) by A. C. Martin, H. S. Zimm and A. L. Nelson; McGraw Hill Book Company, New York. Lists birds, mammals of the U. S. and the foods they eat, particularly plant parts. Also lists values of different plants, trees, shrubs, weeds, aquatics, cultivated plants—to various kinds of wildlife. Line drawings, maps to show U. S. ranges of birds, mammals and plants. Excellent reference for persons wanting to know wildlife plant food habits.

Poisonous Plants of the United States: (1952) by W. C. Muenscher. Line drawings, descriptions of the plants known to be poisonous to the touch or when eaten by man and animals in the U. S. Excellent reference, semi-technical. Bibliography.

Beginner's Guide to Wild Flowers: (1948) by Ethel H. Hausman; G. P. Putnam's Sons, New York. A beginner's book on wild flowers illustrated with line drawings and arranged as to flower color and not by families.

Plants of the Vicinity of New York: (2nd edition 1947) by H. A. Gleason; The New York Botanical Garden, New York. Beginner's key for flowering plants in the New York City and Long Island Area. A few line drawings help in use of key. Glossary and good introductory section. Deals mostly with herbaceous species but touches on grasses, woody plants and aquatics.

Annotated List of the Ferns and Flowering Plants of New York State: (1924) by H. D. House, N. Y. S. Museum Bulletin 254, Albany. All vascular plants in New York and their general distribution in State. No key and no illustrations.

Fieldbook of Natural History: (1949) by E. Laurence Palmer; McGraw-Hill Book Company, Inc., New York. Nearly half of this book is devoted to plants and their identification. Illustrated with line drawings, this book is excellent for beginners in Natural History.

Plant Families—How to Know Them: (1941) by Harry Edwin Jagues; Wm. C. Brown Co., Dubuque, Iowa. Key for beginners illustrated with simple line drawings. Easy to use.

Manual of Cultivated Plants: (1949) by L. H. Bailey; Macmillan Company. Black and white drawings and descriptions of cultivated plants of U. S. and Canada, excluding specialty collections. Technical but good reference for advanced amateur.

Edible Wild Plants of Eastern North America: (1943) by M. L. Fernald and A. C. Kinsey; Idlewild Press. Describes and illustrates with black and white photos and line drawings the edible wild plants of the East. Some recipes given. Very good for campers, etc. who are interested in native wild foods. Bibliography.

How to Know the Grasses: (1954) by R. W. Pohl; Wm. C. Brown Company, Dubuque, Iowa. Simple key illustrating the common and more important grasses in America. Line drawings and distribution map for each species.

Wild Flowers of Western Pennsylvania and the Upper Ohio Basin: (1953) 2 Vols. by O. E. Jennings; University of Pittsburgh Press. Popular book, good descriptions, illustrated with water colors and maps of distribution of the species. Text, including bibliography in one volume, plates in other.

Beaver Trapper's Diary

A Professional's Account of His Experiences Last Season

Thurs., Mar. 1, 1956—Clear, temp. around 27. Started for Old Forge about 4:45 a.m. Stopped at the diner for breakfast and arrived about 8:15. The roads were good all the way. There was a fresh snow around Little Falls. Buster came with the 'plane before I had the duffel carried down to the lake. He took me and the duffel in with two loads. The snow on the lakes is hard, good for landing and taking off. Everything was O.K. in camp. Worked at stowing things and carrying in wood all day. Have kept two good fires going all day and have the camp warm and dry. The Rabbit is around camp as usual. Didn't see anything of the Chicadee yet. Clouded up toward night, a west wind is coming up. Cloudy, temp. 29 at 7:45.

Fri., Mar. 2—Snowed 'til about 10:30. Didn't get up 'til then. Cut up a lot of wood. Worked on the beech blow-down. It is up out of the snow and easy to cut. Had trouble with the chain saw. I was binding it. Am getting better with it. The chain either loosens or tightens. Think I can fix that tomorrow. It started snowing and almost raining again but I worked thru the afternoon 'til almost dark. The temp. was around 35 all day. Cloudy, temp. 30 at 8:10.

Sat., Mar. 3—Sun shone for awhile. Mostly cloudy, temp. around 35. Worked at the wood all day. Have the beech all cut up. Dropped a big dead birch. Haven't seen anything of the Chickadee. Could be he has camped out at the lumber camp. Could hear the chain saws both sides of me today. Will be glad when the lumber jacks get the hell out of here. Stars showing faintly, temp. 30 at 7:30. Looks like a storm coming up.

Sun., Mar. 4—Snow 3 in. Mostly cloudy, snow showers. Was snowing this morning. Must have snowed quite awhile last night. Worked at the wood all day. Have the pile under the guide camp porch as high as I can reach. Clear, temp. 20 at 7:30.

Mon., Mar. 5—Snow 2½ in. Snowed 'til about 1:30 p.m. Didn't get much done on the wood. Will have to work on the wood again tomorrow. My back feels like it might give out any minute. I'm too soft for this work. Temp. was 17 this a.m. Warmed up to 32 in the afternoon. Shaved and got the beaver boards down, tagged all the traps. There are 41 traps altogether. Clear, temp. 28 at 7:45.

Tues., Mar. 6—Cloudy, temp. around 30. Worked at the wood all day. Think I have enough to last me and then some. Expect to start going over the line tomorrow if the weather is decent. My back feels better today. There was a Bluejay around camp. Haven't seen The Chickadee yet. Very light snow, wind NE, temp. 29 at 8 p.m.

Wed., Mar. 7—Cloudy, light drizzle all day. Worked around camp 'til 11. Started out then to scout out my trapline. Started for Mt. Lake. They have been lumbering on the hill between here and the Black River. Saw an otter track on the old beaver pond on the Black. It was fresh. Went over the divide toward the Indian to the first beaver pond. It is dead, as I could see from the air last Fall. Had a hell of a job getting to Mt. Lake. They lumbered there too and have the whole place cut up. There is one main truck road and the whole country is full of skid roads. Didn't get to Mt. Pond 'til 3:30. Saw an otter track on the beaver pond below Mt. Pond. The way the snow is now, I couldn't tell if the pond was live or not. It was live from the air last Fall. There was a big feed bed there too. Left 2 traps on the Black where the otter track was, and 2 at the beaver pond this side of Mt. Pond. Expect to go over toward Jones from Mt. Pond tomorrow. It hailed and there was thunder and lightening last night. Sign of cold weather coming. Caught 2 mice last night. That makes 4 so far. Cloudy, temp. 20 at 7:30.

Thurs., Mar. 8—Snow 5 in. Rained and hailed 'til around noon. Changed to snow then and made about 5 in. Didn't go out. Washed underwear and sox. Read some in an old magazine I found.

Fri., Mar. 9—Snow, 3½ in. Mostly cloudy, wind SW, snow squalls. Took 10 traps and started for the country over from Mt. Pond. Found the 2 colonies on the lower end of the Mt. P. outlet. Beaver had been out there before this snow. Could see part of a feeding place and some fresh cuttings. No place to make sets unless I made ladder sets. Left traps on all colonies and some on dams in between. Saw an otter this a.m. on the old pond at the foot of the hill here. The season opens tomorrow. The new snow is deep and soft in most places. Made better than 8 mi. today but don't feel tired. Snowing lightly, temp. 20 at 8:25.

Sat., Mar. 10—Snow 3 in. Clear, warm in the sun. A real nice day. Went around the places where I had traps hung but only set one, for otter. Had to wallow around a lot making it. It won't be any good 'til the snow covers up my signs. The otter was on the move today. He went to Mt. P. outlet after I went through there this a.m. All the spruce and brush are loaded with snow. Makes it hard to travel and cut trail. Made 12 miles on the map. Saw some jets and a flying boxcar. There are no tracks of anything except a few rabbits and squirrels. Saw what looked like a cat track. It had snow in it. Clear, temp. 20 at 8:30.

Sun., Mar. 11—Cloudy a.m. Rain in the aft. Changed to snow for a few min. then quit. Thawed a lot, took most of the snow off the trees. Went over the hill from Twin Lakes to Snyder. Didn't come out right. Was east of Snyder. The map shows only one ridge between the 2 places but there are 2 ridges with a creek in the gully. This threw me off. Think I can make it next time. The going was tough, snowshoeing was real bad. Made a set on Mt. Pond outlet. Saw where a beaver put his feet in the snow in an open place. Cloudy, wind SW, temp. 25 at 7:45.

Mon., Mar. 12—Cloudy all day. The sun shone through faintly part of the time. There was a big ring around it. Caught a beaver, about a 60 in. male, in my set on Mt. P. outlet. Found where a beaver had been out at the foot of the ledge over from Mt. Pond. I didn't see anything there from the air this Fall. Made a set there. Made 6 sets today. That makes 8 I have out, 4 for beaver and 4 for otter. Saw Billy Baker on the road this a.m. He is going to stay at Camp 9 and trap. Saw cat tracks in my trail almost every where I went. Could be it is the one that followed me around last year. Had the beaver liver for supper. Made over 10 mi. today. Am not going to do the beaver skin tonight. Snowing, temp. 21 at 9:05.

Tues., Mar. 13—Snow ½ in. Caught a beaver in the last col. below (over from) Mt. P. It was a small one. Drowned O.K. Nothing disturbed any other set. Went over to Snyder and found beaver in 2 places there. They had both been out. Set 3 traps there. Not very good sets. Came back over Monument L. and went west on the tote road. Followed it to the end. Crossed the Black but didn't know it and came out on the dead beaver flow below the old lumber camp on Ice Cave. Went up the old logging road for camp. When I got about where the trail should cross to camp, came on a whole mess of last Summer's logging. Tops and skid roads all over. Couldn't find the trail to camp and wasn't sure just where the hell I was. It was dark then. Walked back and forth over the various skid roads but couldn't find the camp or the blue trail. Had to give up about 8:30 and camp out. Was pretty tired then. Also madder than hell. Would have killed any lumberman I could have got hold of. Found a big blow-down with leaning roots, shoveled the snow out of a trench and finally got a fire going. In the dark it was hard to get anything that would burn. Lined my snow trench with boughs and put my oil cloth poncho up. Cooked the beaver liver. Spent a miserable night. Was either too hot or too cold. Had to fumble around finding wood every once in awhile. Finally found an old high stump and got some big pieces which burned pretty good if I kept putting dry spruce limbs under them once in awhile. The snow on top of the roots melted and dripped down some but the oil cloth caught that. Couldn't find the trail even in the daylight but got to camp O.K. I was only a little way from camp. Got breakfast, washed up and hit the sack.

Wed., Mar. 14—Snow 7 in. Snowed all day. Got up at 3:15. Shaved and did one beaver skin. Got supper and did the other one. Took me only about an hr. each on these skins. One is 63 in. and the other 51 in. Camp feels real comfortable after last night. Lucky for me it wasn't too cold last night. Think it must have been around 20. The snow held off 'til I got back. Snowing, temp. 22 at 9:30.

Thurs., Mar. 15—Snow 1 in. Clear, thawed in the sun during the middle of the day. Settled the snow some. Caught 3 beaver, all big ones. Had the hind toe off a beaver and the front toe off an otter. Got the first beaver in the last col. over from Mt. Pond. Had the hind toe off the beaver and the otter toe at the same place. The beaver I got was alive. It tangled the wire on the drowning stone and didn't get off the rock into deep water. This is an open set. It is at the foot of a series of falls and stays open. The otter toe was in a spillway set. The only such set I have as yet. Had the other 2 beaver in the 2 cols. at Snyder L. Am now sure there are 2 cols. there as both of these were large males. Didn't get back to camp 'til 7:20. It was after dark. It gets dark about 6:45 on a clear day. Today was cloudless, probably a weather breeder. Got real cold about 4 p.m. Temp. was 14 this a.m. Clear, temp. 6 at 9:20.

Fri., Mar. 16—Snow 2½ in. Snowed all day. Temp. was 10 this a.m. Got up to about 15 during the day. Didn't catch anything. Did the 3 beaver skins and washed underwear and sox. The snow is a little above my snow mark for last year. All 3 of the beaver were tough ones and didn't stretch much. Think this is caused by poor food and working out when it's cold. All 3 were big but only stretched to 60, 63 and 65 in. They all should have gone about 70 in. by the size of them. Still snowing, temp. 10 at 7.

Sat., Mar. 17—Snow 2 in. Partly clear, heavy cumulus clouds. Temp. was 3 this a.m. Warmed up to about 18 during the day. Didn't catch anything. Left 1 trap by the col. this side of Monument L. and set 2 traps at the place where the beaver is working out on the big creek below camp. It came out last night but turned around and went back in. Too cold I suppose. It must be hard up for feed to come out such a night as last. Got back early and cut down a dead spruce to make kindling. Clear, temp. 10 at 7:45.

Sun., Mar. 18—Clear, warm in the sun. Temp. was 5 below this a.m. The coldest it has been in three trapping seasons. Temp. was 26 when I got back to camp at 3:45. It didn't thaw much but it was a real nice day. The going got tough for about 2 hrs. during the middle of the day. Caught a beaver in the col. on the big creek where I made the set yesterday. Did the skin tonight. It was not tough like most of them are that are working out now. It was good big one and was fat, not red and grizzly.

Had a hind toe in the open set at Snyder. No other sets disturbed. Made good time and didn't get tired 'til the going got tough, that pulled my cork and I'm pooped tonight. Clear, temp. 16 at 8.

Mon., Mar. 19—Partly clear. The sun shone through a light overcast most of the day. Temp. was 2 above this a.m. Didn't thaw any today. Caught a small beaver 44" at Snyder. No other sets disturbed. Fixed up 2 of the sets at Snyder. Changed them from bottom sets to crotch sets. Was good going all the way today. Got back to camp before 3 p.m. Did the beaver skin and shaved. The bobcat is eating on the beaver carcasses at the lower col. toward Jones. He isn't following me around as much as he did last year. Saw an otter track on the dead col. at the foot of the hill here when I came back this aft. It wasn't there this a.m. He came up from the Indian. Haven't any sets there yet. It hasn't opened up any yet. Saw some mink tracks. Cloudy, temp. 21 at 7. Looks like a storm.

Tues., Mar. 20—Clear, thawed in the sun. Temp. was 6 this a.m. There was not a sign of a cloud in the sky all day. It was warm in the sun but there was a cold breeze. Caught 3 beaver. Two big ones and a small one. Got the one that I took the hind toe off of on the last col. over toward Jones. Got another big one and the small one at Snyder. No signs of any stirring anywhere else. Today should have been a weather breeder but it is real clear tonight and no wind. Could be that it will come off nice weather. It has been Winter up to now. Did one beaver skin before supper and another one after. The cats are around the last col. toward Jones. They have cleaned up 2 carcasses and were on the snow bank looking at the one in the trap there. The wire tangled again there and the beaver was alive. Fixed it so it will work from now on. That makes 3 beaver from there and 5 from the 2 cols. at Snyder. Saw a coyote track. One running alone. Clear, temp. 22 at 8:30.

Wed., Mar. 21—Clear, warm. Temp. was 6 this a.m. Was 36 at 2:30 p.m. when I got back to camp. A real nice day for the first day of Spring. Didn't catch anything. No sets disturbed. Beaver had been out on the second col. over from Mt. P. They came out where there was no trap. Didn't change the set. These are shy beaver and I'll kid them along for awhile 'til they get careless. The cats worked over the fresh carcass on the last col. Saw a fox track on the lake by camp when I came back this aft. This was the warmest day so far. The weather breeder theory didn't work. Today was cloudless too. Clear, temp. 22 at 9. Did the last beaver skin tonight.

Thurs., Mar. 22—Clear, warm. Temp. was 10 this a.m. Was 37 when I got back at 2:15. The going was good 'til just before I got back. Didn't catch anything, no sets disturbed. Cut up 2 beaver butts when I got back. Clouded up and snowed lightly about 5:30. A weasel came on the meat I have hanging for the birds tonight. He is missing about 1/3 of his tail. Will be able to tell if it's the the same one if any more come around. Snowing, temp. 30 at 7.

Fri., Mar. 23—Snow 1 in. Clear, temp. got up to 32, it was 17 this a.m. Didn't catch anything. Went down the long trail this a.m. They have been lumbering all around Gooseneck outlet. Found the 2 beaver cols. there that I saw from the air. Beaver had been out in both cols. At the old col. where the smart ones are, they came out right by the house and over the ice to a birch top that the lumbermen dropped there. Got back at 2 p.m. Took a nap, then washed my underwear and sox. Moon and stars showing thru a haze. Temp. 23 at 7:20.

Sat., Mar. 24—Snow 3 in. It was snowing this a.m. Cleared up about 9 a.m. Cold all day. Caught 3 beaver. Got the one at Snyder that I got the hind toe off of. Makes me even with the beaver. Still have an otter toe to make up. Caught a beaver in the second col. over from Mt. P. Didn't

catch any there last year. Forgot to note last night that a small bunch of deer are yarding around Gooseneck outlet. They are feeding on the birch tops that the lumbermen left. Am not going to do any of the beaver skins tonight. Clear, wind SE, temp. 12 at 6:30.

Sun., Mar. 25—Clear, temp. was 0 this a.m. Warmed up to 22. Didn't catch anything. Everything froze up hard. Did the beaver skins and carried in some wood. Have just 3 more weeks here. There are Chickadees and Bluejays on the feeder. One red squirrel comes around occasionally. Haven't seen the weasel again. A Crow was calling in one of the trees by camp this aft. Hardly any jets flying yesterday or today. It clouded up about 6 p.m. Moon showing thru a haze. Temp. 15 at 8.

Mon., March 26—Snow 2 in. Mostly cloudy, temp. was 17 this a.m. Had an otter go over a set that was iced over in the creek over from Mt. P. He went down to the last col. and in by the trap on the dam. Don't think he went over it. Might get him tonight. Caught a beaver in the second col. over from Mt. P. It was one that I got a hind toe off of in the same set last year. Had a hind toe in the best set at Snyder. I was afraid I had them all from there, have got 6 from 2 places. Did the beaver skin when I got back. Heard a cat while I was getting ready to skin the beaver. At least I think it was a cat. It sounded a little like a fox but haven't seen any fox tracks around there and there are lots of cat tracks. There were a few light snow squalls. Started snowing about 3 p.m. Snowing, temp. 27 at 7.

Tues., Mar. 27—Snow 1 in. Clear, temp. was 10 this a.m. The goose feather snow that fell last night was real sticky on the south slopes. Didn't catch anything. The beaver had been out for the first time in the first col. over from Mt. P. Set an S trap for them. They have a long tunnel through the snow by the dam. The stove pipe plugged up tonight. Had to take the pipe off up on the roof and clean it out. The weather still is cold. Believe this is the longest unbroken cold spell I ever saw for March. Clear, temp. 13 at 8:30.

Wed., Mar. 28—Clear, warm. Temp. was 5 this a.m. Was 37 when I got back at 4 p.m. Didn't catch antyhing. No sets disturbed. Believe today was the warmest since I've been here. Tried to put a ladder set in the first col. over from Mt. P. but had to give up on it. There is about 3 ft. of slush and several layers of ice. None of the ice was more than 3 in. thick. It will go out quick once it gets warmed up. Dug down through the snow to the dam on the col. this side of Monument L. Put some bait in but didn't set a trap. The ice is pushed down by the snow almost to the bottom of the pond. Put in another set at the col. on the big creek below camp. Went down below the beaver house and heard water running. Dug down and found a spillway of sorts. There was an old otter hole through it. Got a trap in but it doesn't look as though beaver have been using it. May be they will now that it's open. Think there is going to be a change in the weather. The air has a much warmer feel to it. Have a log cleaned off at Monument L. where I rest if its warm enough. Sat down there today and leaned back against my pack and slept for over half an hr. Clear, temp. 28 at 7:10. Heard a light 'plane around camp when I was at Monument L. Must be Bird just looked the camp over to see if I was O.K. He could see that the snow was off the roof and my tracks around. I keep a fire in the chunk stove so he probably could see smoke too.

Thurs., Mar. 29—Snow 3 in. Cloudy, temp. was 25 this a.m. Didn't catch anything. Had a trap sprung in the spillway set in the last col. toward Jones. Could have been sprung by ice or sticks. There is quite a current there. The going was good and made good time. Went to the cols. on Gooseneck outlet. Made a set in the first col. where they have been coming out. Set an S trap in the second one. Cloudy, temp. 25 at 9:25.

Fri., Mar. 30—Snow 2 in. Snowed about half the day, off and on. Didn't catch anything. The trap I set at Gooseneck was sprung. Think the snow fell off the roof of the tunnel and sprung it. No other sets disturbed. Didn't start out 'til late. Washed underwear and sox. Got back at 5:30. Clear, temp. 20 at 7:45.

Sat., Mar. 31—Snow 3 in. Snowed all day. The sun tried to break through about 8 a.m. but couldn't make it. Caught 2 beaver. No otter sets disturbed. Got one beaver in the upper col. near Gooseneck and the other in the col. on the big creek below camp. There

is about 8 in. of new snow. The going wasn't too bad. It was a miserable day. Had to wear my snow glasses to keep the snow out of my eyes. Didn't do either of the beaver skins. Will do them tomorrow. March has been a tough month. No thaws at all. Still snowing, temp. 22 at 6:50. 48 in. of snow fell in Mar.

Sun., Apr. 1—Snow 1 in. Clear, temp. was 15 this a.m. This is as nice a day as there has been so far. Didn't catch anything. No sets disturbed. Got back early and did the 2 beaver I got yesterday. Carried in wood and cut up some meat. The Chickadees, Bluejays and red squirrels are taking turns on the feeder. Put fresh meat on it again today. Measured the snow around camp this aft. There is a little over 50 in. on the level. Probably will be lots of snow left when I go out 2 weeks from today. If there is I think I'll take the toboggan instead of packing. Clear, temp. 22 at 7.

Mon., Apr. 2, 1956—Clear 'til about 11 a.m. Temp. was 12 this a.m. Was 38 when I got back at 3:30. The warmest it has been so far. Made 2 sets on the first col. over from Mt. P. One crotch set and one dry set at the entrance of a snow tunnel. Caught an otter in the last set. It started to rain about 4 p.m. Started to skin the otter before supper but didn't finish it. Raining. Temp. 32 at 7.

Tues., Apr. 3—Cloudy with fog. Temp. was 32 in the a.m. Was 40 when I got back at 6:30. Had the trap sprung on the crotch set I made yesterday. The beaver took the crotch away and came out the hole and tracked the snow up all around there. Made 2 sets in the next to the last col. toward Jones. Beaver had been out there for the first time. Caught a beaver in the first col. near Gooseneck. Was in a spillway set and went back under the ice and hung up. It took me an hr. and a half to cut through the ice and get it out. Made a set in the second col. at Gooseneck. Didn't do the otter or the beaver skins. Cloudy, with fog, temp. 42 at 9:30.

Wed., Apr. 4—Rain showers. Temp. around 40. Going was real tough in places. Got 1 beaver. The snow is going fast and the water is coming up. There are lots of open places on the creeks. Couldn't see where beaver had been out. Think the rain blotted out the tracks if there were any. Cloudy, temp. 32 at 9.

Thurs., Apr. 5—Clear, temp. was 30 this a.m. Didn't catch anything. Going wasn't too bad. Skinned the otter and did the 2 beaver skins. The snow is all off the ice on the lake. The snow is down about 18 in. on the snow mark.

Fri., Apr. 6—Clear, warm. Temp. was 28 this a.m. Was 45 at 5 p.m. Had a beaver get out of the trap when I came up to it at next to the last col. toward Jones. It left a hind toe in the trap. The ladder set didn't work. The beaver took the ladder away and didn't even spring the trap. Changed a few sets around. Took up the 4 traps at Snyder. Won't have to go there again. Saw fresh bear tracks between the 2 middle cols. and Twin L. Heard him snort once. The going was good 'til about 10 a.m. Went to hell after that. The water is up in all the streams. Makes it hard to get around. Cloudy, temp. 38 at 10.

Sat., Apr. 7—Cloudy, snow squalls in the aft. Strong N. wind. Didn't catch anything. Had the trap sprung again on the ladder set. Changed it to a shelf set. Changed some more sets around. It is the worst possible trapping now. Beaver don't seem to be coming out much and the water is backed up in many places due to slush and ice jams. Found that the 2 middle cols. that I was doubtful about are live but both houses are small, looks as tho a young pair are in each col. Decided not to trap them and took the traps away. They are hard to get to now too. Saw the bear tracks again around the end of the line toward Jones. Had to do a lot of spruce crawling due to the high water. Cloudy, strong N.E. wind, temp. 29 at 11.

Sun., Apr. 8—Snow 4 in. Snowed 'til around noon. Temp. was 22 in the morning. Warmed up to 29. The going was pretty good all day. Probably will be bad tomorrow if it warms up. Didn't catch anything. Didn't change any sets around. Washed my underwear and sox. Clear, temp. 24 at 8:30.

Mon., Apr. 9—Cloudy 'til about 9:30. Clear rest of day. Temp. was 25 this a.m. Warmed up and thawed most of the day. Took up the traps in the 2 last cols. toward Jones. Have traps in only 2 cols. now. Caught an otter near Gooseneck. Made 2 more sets in the first col. over from Mt. P. This is the only place where beaver had been out. Looks as though one of the beaver there has only one hind foot. It drags itself around and only one hind foot track. Have never taken the hind foot off any in this neck of the woods. Brought 11 traps home. Have 14 set and 2 hanging. Tired out tonight. Clear, temp. 29 at 8.

Tues., Apr. 10—Mostly cloudy, temp. was 25 this a.m. Caught a beaver in the first col. over from Mt. P. Got it in a spillway set. Another otter went through on the creek below camp. Made 2 more sets there with the traps that have been hanging there. Got back at noon. Had lunch and did the beaver and otter skins. Cleaned out the stove pipes again. Carried out the tin cans and junk and cleaned up the camp. The Red-winged Blackbirds and Grackles have been around for a few days. The going was O.K. today. Went without snowshoes 'til about 10 a.m. All the stickiness is out of the snow that came Sun. There is a porkey around camp. He has been chewing on the

edge of the porch. Put pepper where he has been chewing and some salt on a stump out front. Clear, temp. 30 at 7:30.

Wed., Apr. 11—Clear, temp. was 20 in the a.m. Got up to 48 in the aft. Warmest day so far. Could go anywhere without snowshoes 'til about 10 a.m. Didn't catch anything. No sign of beaver coming out. Have them about all caught and the few that are left are shy. Tried to find Gooseneck Lake again but gave up after an hour or so of spruce crawling. The bear is all over the Gooseneck country. It is not the same one that is over the hill from Mt. P. The track is smaller. Got back to camp about 1 p.m. Slept 'til 3:45. Shaved and cleaned out the stove again. Have been watching The Hare for the last 15 min. He hasn't found the salt I put out yesterday. Clear, temp. 34 at 7:20.

Thurs., Apr. 12—Clear, temp. got up to 48. Didn't catch anything. Begins to look as though I'd caught my last one. Expect I'll take up the traps at Gooseneck tomorrow unless it looks as tho I'd get something Sat. Got back to camp before noon. Didn't use snowshoes at all today. Went across the lake and cut down the dead spruce that stuck up there where the 'plane comes in to land. Can come in much lower now. Cut up meat enough to last the rest of the time I'm here and took a nap. This warm weather makes me feel dopey. Will start cleaning the camp and packing tomorrow. Expect to leave Sun. a.m. Clear, temp. 35 at 7:30. Just heard something on the screen over the window by my right elbow. Looked out with the flash light and saw the porkey. He is liable to get in trouble if he gets too fresh.

Fri., Apr. 13—Snow 1 in. Snow a.m., partly clear in the aft. Didn't catch anything. Took up the 4 traps at Gooseneck. Probably should have taken them all up. The bear has been around where I skinned one of the beaver on the big creek below camp. Got back before 11 a.m. Took a nap then took the beaver off the boards and cleaned some of the pots and put them away. Packed a few of the things I won't need. Won't have much to do tomorrow. Saw a flock of about 100 geese this aft. They were heading north but seemed to be bucking quite a wind and were changing position and milling around a lot. Tonight a small

flock of 20 or so flew low over camp going west. Haven't see any geese or ducks before today. Light snow, temp. 27 at 9.

Sat., Apr. 14—Mostly clear. Temp. was 25 this a.m. Didn't catch anything. Took the traps up. End up the season with 20 beaver and 2 otter. Was back at camp about 9 a.m. Worked around camp cleaning and packing 'til 3 p.m. Bird flew over then and dropped a note. Said he would pick me up at Indian L. at 10 a.m. tomorrow, weather permitting. He was on floats. Have everything ready to go that I can pack tonight. Have the beaver rolled and in a sack ready to tie on the pack. Am not sorry to leave. Have the beaver caught off pretty close and don't have enough to keep me busy the last week. Had to throw out 4 loaves of bread. Didn't run out of anything. Am close on tobacco, have enough for about 2 days. The only Spring birds I've seen are Red-winged Blackbirds, Grackles and Junkos. Haven't seen any Arctic Woodpeckers this trip. No ducks are here, there is no open water yet. 'Coons and bears are out all over. Checked a few beaver houses today. They were built real low and the water on top of the ice due to the snow has flooded the nest. Noticed this on a few other houses earlier in the season. Some of the houses on live cols. had a hole cut in the side and the beaver had come out and gone over the ice and dug in over the spillway. Must be they had burrows that were higher, or they made nests in the snow. Found several snow nests after the tops melted in but these couldn't be told from feeding places at the time. Should make it to Indian L. easy tomorrow.

Sun., Apr. 15—Cloudy, rain and snow showers in the early a.m. Temp. 35 at 3 a.m. Got up at 3 a.m. The weather looked bad but improved a little after daylight. Packed everything I was going to take out and cleaned the camp up again. Decided that I'd go to Indian L. and take a chance on Buster's coming for me. Left camp at 6:45. Had to use snowshoes for the first 1½ miles 'til I got to the tote road. That was thawed down bare and the walking was good. Made it to the Indian in 2 hr. and 30 min. Had to cross the lake in order to be on the up wind end of it. Was almost across when the 'plane came into sight. We had to make two runs before we got off. He had floats on. There was a thin ice with about 4 in. of water under it on top of the ice. Finally got into the air and landed at Buster's place. Didn't have any money to pay him so told him I'd sell my beaver at Long Lake to Lash, then come back through Old Forge and pay him. Went to Axtell's place and had the beaver tagged. Went to Long Lake and found Lash had gone to get a chain saw out of the woods but was expected back shortly. Had a spaghetti dinner while I was waiting. Sold the beaver and stayed around for a couple of hrs. watching Lash and Black buying beaver. No one had more than 6 beaver and all were teed off at the Dept. for extending the beaver season. They all had their traps taken up by the time they heard of the extension. Stopped and paid Buster. Got home at 8 p.m. End of beaver trapping for 1956.

—Ed Maunton

The Color of

Hatchery Coloration

IT'S probable that, as a group, trout fishermen can make no greater claim to sanity than can smelt fishermen, duck hunters or snowshoe rabbit hunters—to name only a few of the more mentally deranged.

The average trout fisherman's attitude toward taking fresh-stocked hatchery fish is a case in point. Very few have any aversion to the practice; will, in fact often go to extremes to be first in line to fish heavily stocked waters. Yet as they pop trout after trout into their creels, the word goes up and down the line—"Damned hatchery fish! You can tell them every time. Look at 'em, pale as a ghost."

Now we don't feel that we have any mandate to change human nature, particularly that of trout fishermen, even if that were possible. But we *do* feel that we have an obligation, so long as we operate hatcheries, to produce healthy, vigorous trout that will have the best possible chance, when properly stocked, to survive, acclimate themselves as quickly as possible to natural environment and provide satisfaction, to the greatest degree possible, to the angler.

The appearance of the trout stocked is, then, an important consideration. If, by supplementing hatchery diet, we can produce fish for stocking that exhibit the radiant coloration of wild trout we shall materially increase the pleasure of the anglers who catch these fish. Accordingly, this year several methods of coloration, originally developed on an experimental scale by the Cortland Nutrition Laboratory, have been tested on a production basis at the Bath, Catskill, Crown Point and Rome hatcheries.

Hatchery fish may be colored by the addition of various supplements to the standard diet. Three materials—paprika, alfalfa meal and shrimp heads were used in the tests. The colors produced varied for the three additives in much the same way that the color of wild fish varies from stream to stream. Color also was quite different for brooks and browns fed the same material. Since color varies with the coloring agent added to the diet, if one wishes to produce trout with natural color he may select a material according to his conception of a normal wild fish.

If one wishes brown trout having yellow and orange coloration of fins and body, and orange spots, then alfalfa meal or paprika are admirably suited. The colors closely resemble wild fish from many environments. However, if one insists on reddish coloration, shrimp heads (the unsaleable waste from shrimp) constitute the only material tested which will do it.

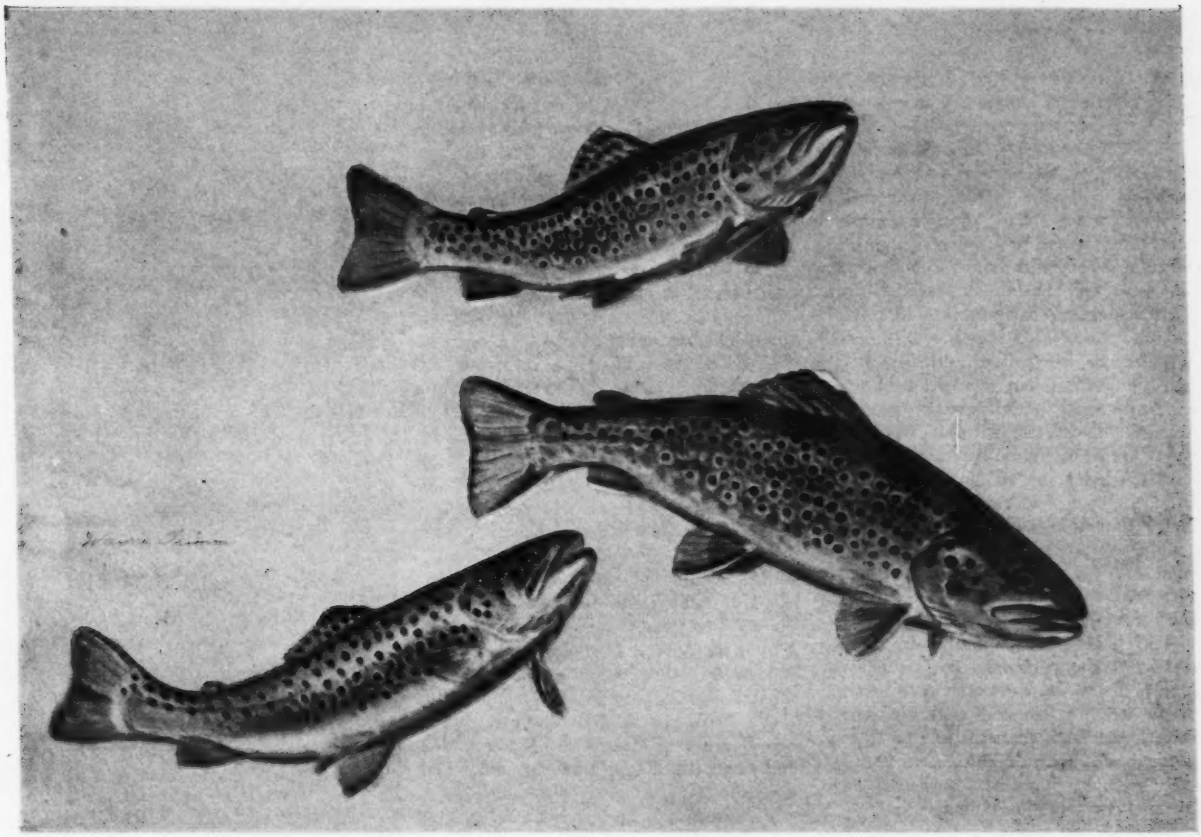
For brook trout, both paprika and shrimp heads produce reddish fins and body colors. Surprisingly, red spots seem harder to produce on brooks than on browns, although brook trout fed shrimp heads develop a few such spots.

Following the preliminary tests, one pond at each of the four hatcheries have been fed the shrimp head additive. At the same time in these same ponds a method of "conditioning" the fish is under trial, attempting to toughen them so that they will better adjust to the big change from the hatchery to the stream environment. In this first experiment, the water current has been trebled for four hours each day for several months. In other ponds the density of the fish has been greatly reduced from the normal hatchery rearing density. Other conditioning methods are planned for future trial.

The colored and conditioned fish have been planted in Putts Creek (Essex County), Mill Creek (Warren County), Point Rock Creek (Oneida County), and Chittenango Creek (Madison County). Department employees plan to run creek checks on these streams, and conduct shocker studies to learn the results of the conditioning. The field testing part of the program will be under Dingle-Johnson Project F-11-R.

—D. C. Haskell,
Fish Hatchery Foreman

# of Trout



Top, hatchery brown trout fed on shrimp heads. Center, wild brown trout. Bottom, brown trout fed on normal hatchery diet.

Natural Coloration

THE coloration of trout depends primarily upon the functioning of three types of cells found in the layer immediately beneath the skin. These different cells, each with a specific function are the melanophores, iridocytes, and chromatophores. In combination they produce the beautiful colors of wild trout.

Melanophores contain a black pigment (melanin) which flows freely within the cell upon proper nerve stimulation. The flow is activated by stimuli received from the eye. Thus when a fish is swimming over a light colored background, the melanin is concentrated into a small black dot in the center of each cell. By this reaction the fish is attempting to appear lighter in color to match more closely the background over which he is swimming. This same fish over a dark background appears darker, because under such conditions the melanin flows outward to fill more completely each cell. Since blind fish no longer receive the optic sensations which normally control the flow of melanin, they are always black or at least very dark in color.

Iridocytes are small cells found throughout the skin, and also within the eye and the air bladder. Guanin, an excretory product, is deposited in these cells. Iridocytes are very opaque, have a strong reflective power, and impart a silvery sheen to the fish. The basic iridescent background color of trout is essentially reflected light from the guanin deposits.

Chromatophores are specialized color cells which selectively store either yellow or red pigments in varying degrees of intensity. These pigments or coloring agents, known as carotenes or xanthophylls, must come from the diet of the fish. The natural food of trout contains enough of these pigments to impart bright color to the fish, but they are deficient in ordinary hatchery diets. Thus, with little or no yellow and red pigment available to the chromatophores, hatchery fish tend to have little coloration. Such fish, however, will maintain natural high coloration if they are fed natural foods or have natural pigments incorporated in their diets. For example, in some hatchery ponds the water normally carries a small supply of natural food, and trout in these pools often resemble wild fish in color.

It is important to note, however, that the essential natural pigments are found mainly in foods (e.g., aquatic plants and animals) which are not readily collectible in sufficient quantities to feed the populations of trout usually maintained in a hatchery. Even if the lack of pigment affects only the appearance of the fish, it would be advantageous if related and easily incorporable pigments could be found which would impart coloration. As noted above, an experimental program has been instituted to test various possible diet supplements, both animal and vegetable, which may enable hatcheries to produce trout as attractive in coloration as their wild brethren.

—D. R. Brockway,
Aquatic Biologist

The Gypsy Moth

MORE than 80 years have passed since the gypsy moth, a most destructive pest of forest, fruit and shade trees, was brought from Europe into Massachusetts and accidentally became established there. Despite vigorous control efforts by the Federal and State governments, the insect gradually spread throughout most of New England and eventually became firmly entrenched in easternmost New York State.

Although epidemic outbreaks of the gypsy moth are somewhat predictable, its rate of spread in the past two years has followed no precise pattern. The female moth *does not fly*, and natural spread is thus dependent on winds, usually shortly after the eggs hatch in the Spring. The tiny caterpillars spin down from the twigs, are picked up by the winds and sometimes carried for long distances before being dropped. Fortunately, through the years during these critical periods, prevailing winds have generally been toward the northeast; otherwise the insect might long ago have spread into other sections of the country. Isolated infestations have been found from time to time outside of the general area of infestation, but in such instances immediate measures have been taken to eradicate them.

In 1953 the worst gypsy moth outbreak in history occurred and nearly 1½ million acres of woodland were defoliated in New England. Apparently that Spring tiny caterpillars by the millions were picked up by winds coming from the east and carried for miles deep into New York State, for surveys since that time have shown the presence of light scattered infestation over nearly 9 million acres previously free of the insect. Infestation now extends into Long Island, northern New Jersey, northeastern Pennsylvania, and in New York westward into Delaware and Otsego counties and as far west as Utica in the Mohawk Valley. The result is that about one-third of the State is now infested by this pest.

The gypsy moth has four life stages: Egg, larva (or caterpillar), pupa (or resting stage), and adult (moth). It produces one generation a year. Female moths lay eggs in late July and early August on tree trunks, under loose bark, under rocks and ground litter, on stone walls, and in other shady, protected places where they are difficult to locate. The eggs are in clusters, each of which is about ¾ inch wide and about 1 inch long. The clusters, which are covered with hair from the body of the female, look like buff felt, and contain about 400 eggs each. The eggs usually hatch in early May and the larvae feed on foliage until mid-June, by which time they are 1½ to 2 inches long. They can be identified by pairs of red and blue dots on the back. In late June or early July the larvae change into pupae and then become moths. Emergence of moths is at its height in July and continues into mid-August. The male moth is a strong flier, able to range far as he searches for a female with which to mate. Although the female has a 2-inch wing spread, her heavy body prevents her from flying. (See illustrations pages 24, 25.)

Defoliation by larvae retards the growth of trees and reduces marketability and value as timber. Some trees survive several defoliations before they die, but hemlock, and often white pine, die after one defoliation. Furthermore, trees weakened by defoliation are susceptible to disease and attacks of other insects, notably bark borers. During outbreak years, immeasurable damage is done to recreational areas, farm woodlots, parks and shade trees, and through the years, damage because of decreased timber yields and outright killing of trees, has amounted to millions of dollars.

Far exceeding such figures, probably, are intangible losses. The loss of trees affect stream flow, increases fire and erosion hazards, reduces land values, and destroys wildlife habitat. Where openings are left in the forest stand, the forest floor dries, and weed trees reproduce rapidly.

Gypsy moth egg clusters on trunk

THE Federal government and the affected states work co-operatively to prevent spread of the insect to the rest of the country. This is accomplished through enforcement of quarantines and by surveys conducted along the periphery of the infested area, followed up by spraying. Protection of the extensive oak forests of the Appalachian Mountains and of the South and Mid-west is a special objective of control efforts. In the generally infested area, the individual states spray tree growth in sections where the insect is building up to a point where defoliation would otherwise occur.

In addition, surveys are made over extensive areas to find whether gypsy moth infestation exists, to determine intensity, and to check on the effectiveness of spraying operations. Large areas are surveyed by special traps, each baited to attract male moths within a radius of

Comparison of treated and untreated timber

about half a mile. The bait is an attractant that is extracted from the sex glands of female moths. The required amount, held in a cartridge made from corrugated or filter paper, is placed inside each trap. The trap is lined with sticky material that catches the moths. This Summer in New York State alone, it is planned to survey by the use of traps some 4 million acres to the west of known areas of infestation. The area includes all or parts of Oswego, Oneida, Onondaga, Madison, Cortland, Chenango, Otsego, Broome and Delaware counties, with limited trapping also planned in Clinton, Franklin, Westchester and Nassau counties.

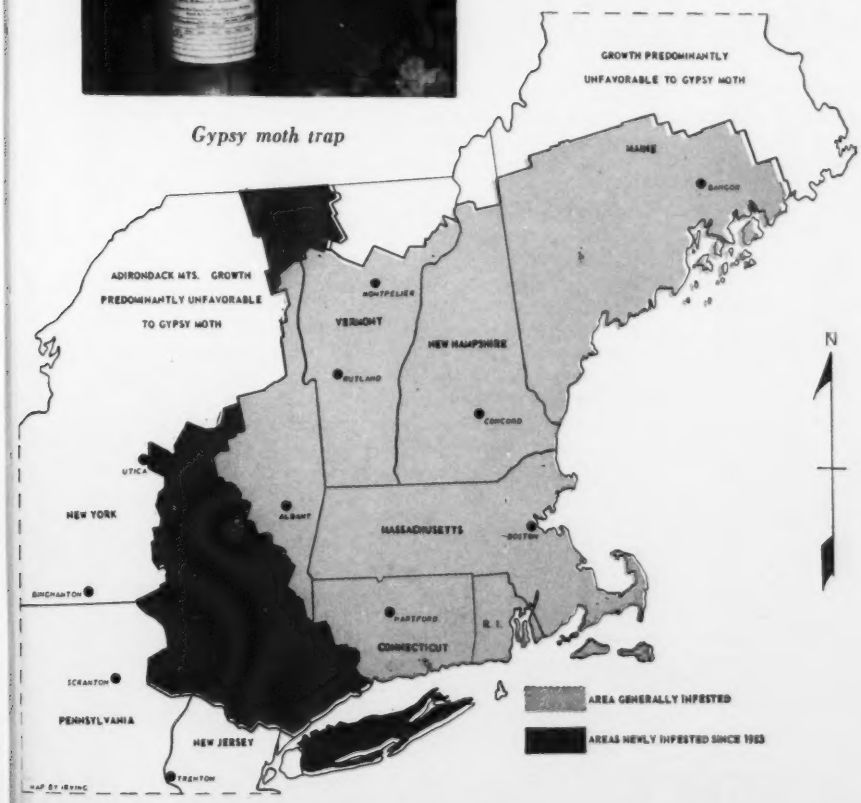
DDT spray applied during the larval period (from about May 1 to June 15) effectively controls the gypsy moth. Most of the spraying is done by aircraft, although ground mist blowers are used to advantage at some locations. When properly applied the spray is not harmful to people, domestic animals, wildlife, or plants. For treating extensive areas, a DDT oil solution is dispensed from aircraft as a mist spray at the rate of ½ to 1 pound of DDT in 1 gallon of spray to the acre. A single-engine aircraft flying 100 feet above the tree tops effectively sprays a swath of 100 feet, and treats from 250 to 300 acres an hour. A multi-motored aircraft flying 200 to 300 feet above the tree tops ordinarily sprays effectively a swath of 500 feet. It can treat 1,500 to 4,000 acres per hour, the number of acres depending on the load capacity of the 'plane and the ferrying distance from the service airport.

Gypsy moth trap

The recent serious spread of the gypsy moth has aroused nation-wide interest, for it is apparent that continued spread to the rest of the country can be prevented only through greatly expanded control programs. Interested groups have been urging Congressional action to appropriate $1½ million for an expanded program this Spring, but at this writing no supplemental funds have been made available to the U. S. Department of Agriculture for that purpose.* Under consideration for immediate spraying (should additional monies be appropriated) are large contiguous areas in northern New Jersey, northeastern Pennsylvania and southern New York, for here the growth and terrain provide a natural gateway for the insect into the vast stands of highly susceptible oak woodlands to the south and west. The area tentatively scheduled for spraying in New York extends along the New Jersey-Pennsylvania border from Suffern, Rockland County to Hancock, Delaware County, and is from 8 to 10 miles in depth. It is also planned to spray smaller areas near Oneonta.

Meanwhile, back in the heavily infested areas of New York the Bureau of Forest Pest Control, through surveys conducted during the Fall and Winter, has found epidemic build-up of the insect over more than double the acreage which required treatment last year. Nearly 100,000 acres of woodlands will be aerially sprayed this Spring in Clinton, Essex, Warren, Washington, Saratoga, Rensselaer and Columbia counties to prevent gypsy moth defoliation.

Federal and state quarantines are maintained to prevent artificial spread of the insect to uninfested areas. They regulate the transportation from the infested area of materials that may harbor moth forms. But one means of spread not prevented by enforcement of quarantines is the transportation of the insect on automobiles, trailers and trucks. Drivers should examine their vehicles and remove any forms of the gypsy moth before traveling from an infested to an uninfested area. This is particularly important if the vehicles have been parked in an area of heavy infestation.



THERE is one way in which readers of THE CONSERVATIONIST can assist in our gypsy moth program. Our manpower is very limited, and with the tremendous acreage involved it is impossible to survey all of it each year. We have a fairly accurate picture of infestation in the area designated on the map as generally infested. However, in the section where more recent spread has occurred, we do not have detailed information regarding infestation, and outside of the known infested area no surveying has as yet been done. If sportsmen, property owners, or others who enjoy our forests should discover evidence of the gypsy moth in or west of the newly infested area, it would be appreciated if they would report it to the Conservation Department. It is also important that any areas of heavy gypsy moth egg deposition discovered anywhere in New York State be reported. Any details that will assist us in later locating the infestation should be included.

—WILLIAM E. MASTERSON,
Field Supervisor, N.Y.S.C.D.
—DAVID MITCHELL, *Area Leader, USDA*

* On May 22 we were notified by Washington that $322,000 had been made available.

Montezuma Marsh

SINCE June 24, 1954, official opening day for the New York State Thruway, approximately five million vehicles carrying an estimated fifteen million people have rolled across the State on this broad concrete expressway. About mid-way between Albany and Buffalo they travelled through the rich agricultural plains at the head of the Finger Lakes, speeding past traffic interchanges 40 and 41 at Weedsport and Waterloo and in between, at 60 miles per hour, they flashed through the Montezuma National Wildlife Refuge. It's a safe bet that no other wildlife refuge in the world has been seen by so many people in so short a period.

Of course, at that speed few of the fifteen million had more than a fleeting glance at the 6,000-acre expanse of water, marsh growth and swamp that is Montezuma, but for most, at least, it registered because of the distinctive flying goose signs erected by the U. S. Department of Interior's Fish and Wildlife Service to mark the refuge boundaries.

But come back again another day* to the vast fresh water marshes along the Clyde and Seneca rivers and see what a "working" wildlife refuge is doing to build and perpetuate our waterfowl and migratory bird resources. For this is not a 6,000-acre chunk of marshland just lying outdoors with a fence around it. It's a 'round-the-clock, January-to-December job of management designed to feed and strengthen thousands of geese in the Spring; send them on their way to the breeding grounds to the north, welcome them back in the Fall, feed them again, fan the surplus out to be harvested during the hunting season, send the majority on to wintering grounds to the South.

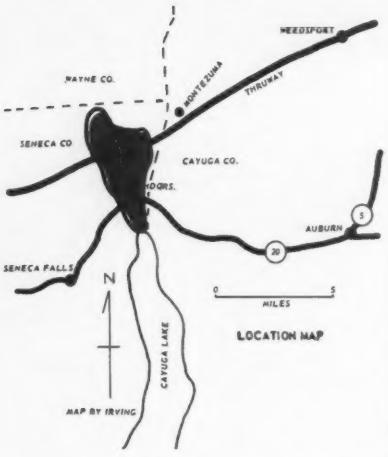
Nor is Montezuma deserted in the Summer. A lot of ducks —mostly blacks, mallards, blue-winged teal, wood duck and in late years, some redheads and ruddy ducks stay right there to nest and bring off their broods to swell the Atlantic flyway population.

All this happens at Montezuma because it's traditionally a mecca for waterfowl, a key link in the Federal refuge system, serving as a resting and feeding ground during migration from the Hudson and James bay breeding areas to wintering grounds at Chesapeake Bay and south. But, as noted above, it happens even more effectively because of good management.

Key features in the management plan are two huge but shallow diked impoundments. Lawrence Smith, Refuge Manager at Montezuma, describes these as the main pool and the storage pool. In the main pool there are 1,500 acres of water, cattails and assorted aquatic plants that ducks love; 1,200 acres of water and swamp in the storage pool, which, as the name suggests, serves as a reservoir to maintain water levels in the main pool. Dikes and strategically located sluices and water control structures permit flooding or drainage as the need occurs, making it possible to stimulate or repress aquatic vegetation. Most important though, ability to lower and raise the water levels is the key to the early Summer seeding of hundreds of acres of rich lowlands with grain.

(Continued on page 22)

* The refuge headquarters is located just off Routes 5 and 20, east of Seneca Falls. The public is welcome.



(continued from page 20)

Last year two tons of Japanese millet were broadcast by aeroplane over the drained mud flats of the main pool, then flooded from the storage pool in the Fall to set the table for migrating waterfowl. Smith's records show that through October last year more than 100,000 ducks came to the millet dinner at Montezuma.

But if millet is the main course, there's dessert too—such upland grains as wheat and rye which are planted by conventional farming methods on the 400 acres of refuge croplands. This, primarily, is for the geese, and they love it!—as indicated by ever increasing Spring concentrations, 3,000 in '53, 14,000 in '54.

While waterfowl is the main show at Montezuma, it's not the whole story. The big marsh is a haven for fur-bearers, particularly muskrats which are harvested on a share basis by local trappers. Trapping quotas are set to maintain proper population levels of muskrat, thereby holding cattail growth in check to favor the waterfowl. Deer are common on the area, even affording an occasional open season to control their numbers. Song birds, shore birds, birds of prey, call in or make their homes at Montezuma. The records credit it with 245 different species of birds.

In the 19th Century and early in the 20th land drainage frenzy swept the land. Montezuma didn't escape, and though successful muck farming never materialized in the heart of the swamp area, its value for waterfowl was lost. Finally, in 1937, following a series of drought years and a major decline in waterfowl all across the Nation, Federal money became available for purchase of the area as one in a flyway chain of migratory waterfowl refuges. Dikes were built and water again flowed over the Montezuma flats. The great marsh was back in the wildlife business, again fulfilling its rightful destiny.

—AL. BROMLEY

Moths a

BUTTERFLIES and moths provide one of the most fascinating and colorful aspects of a New York Summer. Our appreciation of them—and of other natural citizens—depends largely upon our knowledge, and this article and the paintings which go with it are presented in the hope that interest will be stimulated, knowledge increased, and enjoyment of the outdoors multiplied. But basic conservation is also involved; the Gypsy Moth, for example, is presently a very serious menace. All of us should know more about him.

More than 2,500 different kinds of moths and butterflies have been found in New York State. Although nearly all of these feed on living plants, only a few —perhaps 150—are numerous enough to be considered pests. Those which H. Wayne Trimm has illustrated on the following pages are the larger or more brightly colored ones which are most apt to be seen by anyone who spends much time outdoors.

We may wonder why these large insects, which often seem so common, do not more often become pests. The answer is that parasites and predators do a pretty good job of holding insect populations in check. There are many tiny wasps which destroy moth and butterfly eggs. Other wasps and flies kill the caterpillars and pupae, and finally, the adults are sought as food by birds. And fungus, virus and bacterial diseases may strike in any stage. But in spite of these normal and natural controls, an insect often becomes a pest when introduced into an area without its usual parasites or diseases, or when we use methods of cultivation which may favor certain insects.

The life histories of our moths and butterflies are all much alike. The tiny larvae or caterpillars hatch from eggs which the females deposited near their food plant. The caterpillars may eat the egg shells as their first meal, or go directly to the leaves of their host. Some caterpillars can feed on almost any plant with green leaves, others survive only if they can obtain the leaves of one particular species of plant. Most are in between; they feed on a number of different, though related, plants.

A caterpillar spends most of its time eating and growing. Several times during its development it stops to shed its skin—its only "skeleton." As the old skin is discarded, a new one (a size larger) is formed, and the caterpillar grows until it fills the new one, then repeats the shedding process. When it reaches its full size it prepares for a resting or pupal stage. Many moths spin silk cocoons in which to pupate, while others go into the ground. A butterfly makes no cocoon; instead, it uses a few silk threads to hang its pupa (chrysalis) from the host plant or in some more protected spot.

But in any case, during the pupal stage a complete remodeling takes place, with the result that the emerging adult looks entirely different from the larva. While the larva is designed for feeding, the adult is designed for reproduction and dispersal, and many of these adults do not have mouthparts which permit them to feed at all; they survive for the few weeks of their adult life on fats stored in their bodies during the larval stage.

Most of our larger moths and butterflies spend the Winter in the pupal stage. Some over-winter in the egg stage —a few as caterpillars, and a smaller number as adults either hibernating in a sheltered spot or flying south to a warmer climate.

Collecting

THE popularity of insect collecting as a hobby lies partly in the ease with which insects can be preserved. Ethyl acetate or carbon tetrachloride (dry cleaning fluid) are the best killing agents. They are not dangerous to the collector, will kill insects quickly, and will not discolor the specimen nor make it brittle. A simple killing jar can be prepared by putting a few drops of killing agent on a wad of cotton or tissue paper in a fruit jar. A jar with a half-inch of plaster of paris in the bottom will remain effective for a much longer period. Do not wet moths and butterflies with the fluid or you will have a messy looking specimen; the fumes in a tightly covered jar will do the job quickly.

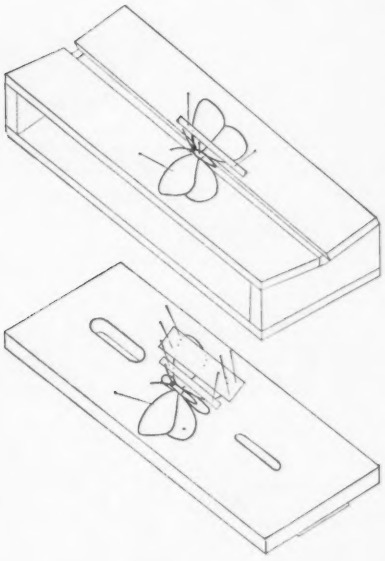
Once killed, insects can be preserved merely by drying. Since they are very brittle when dry they should be spread soon after death and held in the desired position during the drying period. Moths and butterflies should have their wings spread to give a pleasing appearance.

Spreading boards may be purchased from any of the biological supply houses, but they can be made at home with very little effort. One of the simplest is a

* Published by permission of the Director, New York State Museum and Science Service.

s and Butterflies of New York

by John A. Wilcox, *Associate Curator of Entomology, New York State Museum**



Two types of boards used for mounting of insect specimens

half-inch board of soft wood, six or eight inches wide, with a series of cavities drilled down the middle to accommodate the bodies of the insects. Each cavity should be two to three inches long. They should not all be the same width, but should vary from a quarter to a half-inch to accommodate moths and butterflies of different sizes. A sheet of thin cork or balsa wood is placed under the cavity to hold the pins which keep the body of the insect in place.

To spread a moth or butterfly, place the body in the cavity, using pins to hold it steady. Move a front wing into position on the board by means of a pin. Don't touch the wings with your fingers or you will rub the scales off. Then move the hind wing into position and pin a narrow strip of paper across the wings near the body to hold them in position. The same procedure is used for wings on the other side. Finally, place a wide strip of paper across the uncovered part of the wings and remove the pins which were used to place the wings in position. The insect should be left on the spreading board for a week or two, depending on its size. The large moths require a longer time to dry.

After mounting and fixing, moths and butterflies can be stored in shallow boxes filled with cotton and covered with glass. The glass cover should rest lightly on the insects and will hold them in place. But if the insect is pinned (suspended in mid-air by a pin through its body) the collector can handle his specimen and examine both upper and lower sides. A different type of storage box, however, must be used for pinned insects. It should be deeper (a cigar box will do) with a quarter-inch sheet of cork or balsa wood in the bottom to hold the pin. The insect is pinned when it is spread, and should be placed on the upper half of the pin which pierces the body between the wings. Special insect pins are almost a necessity; household pins will rust in a few years and destroy any insects mounted on them.

Moths

CECROPIA MOTH *(Hyalophora cecropia):* Cecropia is our largest moth. It is fairly common but not often seen unless it comes to lights at night. It is frequently the cornerstone of an amateur's collection, or may be brought to a museum to be sold. (I might mention here that moths and butterflies have practically no monetary value. Very few museums or commercial organizations will purchase insects unless they form a scientifically interesting collection built up over most of the collector's lifetime, and even then, the price paid will not be worth the collector's time and effort.) Larvae of the Cecropia eat the leaves of a large number of deciduous trees and shrubs.

PROMETHEA *(Callosamia promethea):* Male and female Promethea moths differ strikingly in appearance. Their caterpillars feed on spice-bush, wild cherry and tulip tree.

CYNTHIA MOTH *(Samia cynthia):* Large moth, brought to America from Asia for the purpose of producing commercial silk from its cocoon. The commercial enterprise failed but the moth has become "naturalized" in several areas in New York. Larvae may completely defoliate the ailanthus or Tree of Heaven.

LUNA *(Actias luna):* One of our most beautiful moths. The delicate green and lavender fade after death. The caterpillar feeds on walnut, hickory and many other trees.

POLYPHEMUS *(Antheraea polyphemus):* Large moth, most often seen flying around lights at night. Its larvae feed on oak, birch and many other trees. The pupa is sometimes very active, twisting violently inside its cocoon.

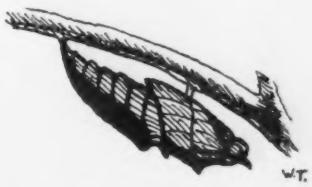
IO MOTH *(Automeris io):* Sometimes a very common moth. Its larvae can live on a very wide variety of trees, shrubs and smaller plants. It is one of the few caterpillars which can "sting." The spines carry a fluid which can be very irritating to the skin. It is entirely green except for a narrow red and white stripe along its side.

Larva of the Tiger Moth

BUCK MOTH *(Hemileuca maia):* Gets its name from the fact that it flies during deer season. It may be seen flying throughout the day. Its host plants include oak, willow, cherry and hazel.

IMPERIAL *(Eacles imperialis):* Soft brown and yellow of its wings make this one of our most attractive moths. The larvae feed on a large variety of trees and shrubs. It pupates in the ground; does not spin a cocoon.

REGAL MOTH *(Citheronia regalis):* Usually rather rare. Its larva, known as the hickory horned devil, is provided with several long curved horns near the head. It feeds on many different trees.



Pupa of butterfly

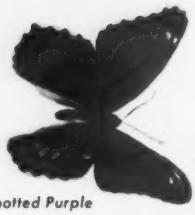
SPHINX MOTHS are graceful and powerful in flight. They are frequently attracted to lights. Their caterpillars are provided with a sharp, though harmless, horn or "eye-spot" on their tail end. They do not spin a cocoon but enter the ground to pupate. The larvae of the Twin-Spot Sphinx *(Smerinthus geminatus)* feed on wild cherry; that of the Modest Sphinx *(Pachysphinx modesta)* on poplar and willow. Achemon Sphinx *(Pholus achemon)* and Satellite Sphinx *(Pholus satellitia)* feed on grape and Virginia creeper.

WHITE LINED SPHINX *(Celerio lineata):* Is one of the commonest Sphinx moths. It flies day and night and is often seen at flowers. The larvae feed on many plants, including purslane and evening primrose.

(Continued on page 26)

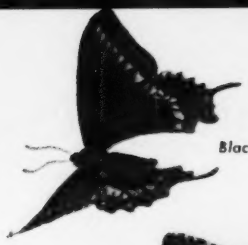
Butterflies of

Dog-face


Red-spotted Purple

Baltimore

Question Mark


Black Swallowtail

Banded Purple

Pipevine Swallowtail

Buckeye

Tailed Blue

Imported Cabbageworm

Red Admiral

Zebra Swallowtail

Melissa Blue

Tiger Swallowtail

Compton Tortoise Shell

Common Sulphur—male

Common Sulphur—female

Long Tailed Skipper

Frosted Skipper

Little Wood Satyr

Mourning Cloak

Monarch

Viceroy

American Copper

Giant Swallowtail

Regal Silverspot

Great Spangled Silverspot

Wood Nymph

Spice bush Swallowtail

Regal

Satellite Sphinx

Polyphemus

Cynthia

Gypsy—female

Gypsy—male

White-lined Sphinx

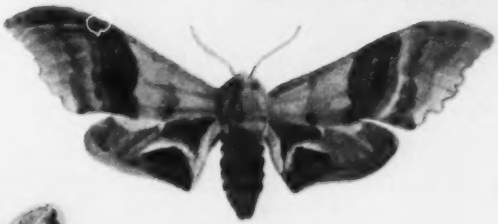
and Moths New York

Painted by Wayne Trimm from specimens loaned by N. Y. S. Museum, Albany

Tiger

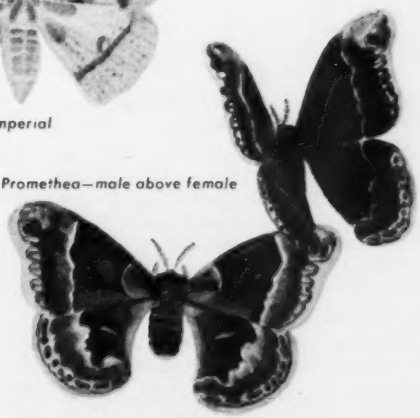
Black Witch

White Underwing

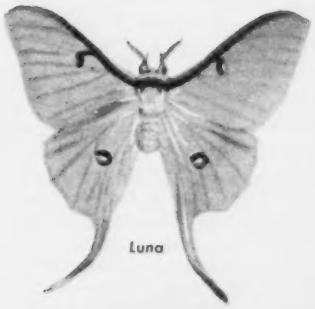


Modest Sphinx

Imperial



Promethea—male above female



Luna

Buck

Tomato Hornworm Sphinx

Cecropia

Io—male above female

Briseis Underwing

Achemon Sphinx

Clear-Wing Sphinx

Twin-spot Sphinx

(Continued from page 23)

TOMATO HORNWORM SPHINX *(Phlegethontius quinquemaculatus):* Is a serious pest of tomato and tobacco. The adult is frequently mistaken for a hummingbird hovering over flowers. Since its tongue is as long as its body, it sucks nectar from flowers without alighting. In the pupa the tongue is free from the rest of the body like a jug handle.

CLEAR-WING SPHINX *(Hemaris thysbe):* Is also a frequent visitor at flowers during the day. It may be mistaken for a dark colored bumble bee. The larvae feed on viburnum.

TIGER MOTH *(Apantesis virgo):* Is a representative of a rather large family, all of which are called Tiger Moths. The very fuzzy caterpillars are usually called "bears" —woolly bear, yellow bear, etc. They feed generally on herbaceous plants.

UNDERWING MOTHS are some of the larger and certainly the most brightly colored members of the cutworm family. At rest the hind wings are completely covered by the front wings which look very much like the bark of the trees on which they rest. The White Underwing *(Catocala relicta)* and Briseis Underwing *(Catocala briseis)* both feed on birch, poplar and willow. Other members of the group may be found on other trees including the conifers.

BLACK WITCH *(Erebus odora):* Is a visitor in New York. Its caterpillar feeds on trees related to the acacia in tropical America and the states bordering the Gulf of Mexico. It is a strong flyer and occasionally wanders as far north as Rochester and Plattsburgh.

GYPSY MOTH *(Porthetria dispar):* An undesirable alien, provides one of the greatest insect dangers to our forests. The larvae have been reported feeding on more than 500 different kinds of plants. It can completely defoliate large tracts of woodland. The U. S. Forest Service and the N. Y. State Conservation Department are engaged in a tremendous effort to control the gypsy moth and to prevent its spread across the country. In this State it is still limited to the eastern third.

Butterflies

MONARCH *(Danaus plexippus):* Is one of our best known butterflies. The Monarch can fly great distances. Individuals which reach maturity late in Summer band together and fly to the warmer climate of the Gulf States for the Winter. During the following Spring they migrate northward again. The caterpillar, with black, yellow and white stripes around it, feeds only on milkweed. Birds leave the Monarch alone, apparently because it tastes bad.

LITTLE WOOD SATYR *(Euptychia cymela)* and the WOOD NYMPH or GRAYLING *(Cercyonis pegala):* Dull colored little butterflies, usually seen in open woods or wet meadows flying near the ground. When disturbed they flit through the tall grass or shrubbery. Their larvae feed on grass.

BALTIMORE *(Euphydryas phaeton):* Usually seen near wet meadows near its host plant, turtlehead.

SILVERSPOTS or FRITILLARIES: There are several species of Silverspots which are commonly seen flying or visiting flowers in open meadows. They are easily recognized by the distinctive spots on the under side of the wings. Their larvae feed on violets. The Great Spangled Silverspot *(Speyeria cybele)* is one of the largest and most common. The Regal Silverspot *(Speyeria idalia)* is less common, most often seen in wet meadows.

Tent caterpillar "tent"

QUESTION MARK *(Polygonia interrogationis):* So named because of a small silver mark on the under side of the wings. These butterflies are frequently seen feeding on rotting fruit, flowers or carrion. The larvae feed on elm, hackberry, nettle, and hops.

COMPTON TORTOISE SHELL *(Nymphalis j-album):* Its larvae feed on white birch and willow.

MOURNING CLOAK *(Nymphalis antiopa):* Spends the Winter in the adult stage, hibernating in hollow logs or other sheltered places. It may be seen flying even in January on warm days. The caterpillars feed on elm, willow, poplar and rose.

RED ADMIRAL *(Vanessa atalanta):* Frequently seen on thistle flowers. Its larvae eat leaves of nettle, hops and related plants.

BANDED PURPLE *(Limenitis arthemis arthemis)* and the RED-SPOTTED PURPLE *(Limenitis arthemis astyanax):* Are considered to be different races of the same species. The Banded Purple is more common in the northern part of New York, while the Red-Spotted Purple rarely occurs north of the Mohawk River. Caterpillars are usually found on birch, poplar, cherry and willow.

VICEROY *(Limenitis archippus):* Closely related to the Purples but mimics the Monarch in color. It obtains some protection from birds because of its similarity to the Monarch. Its larvae feed on willow, cherry, poplar and apple.

BUCKEYE *(Precis lavinia):* Frequently visits flowers and mud puddles. The larvae feed on various plants including plantain, snapdragon and sedum.

TAILED BLUE *(Everes comyntas)* and the MELISSA BLUE *(Lycaeides melissa)* are our smallest butterflies. They are usually seen in open meadows where their host plants grow. The larvae eat legumes such as bean, bush clovers, and lupine.

AMERICAN COPPER *(Lycaena phlaeas americana):* Seems to carry a chip on its shoulder. It will attack larger butterflies and other insects which fly near it and drive them away. Klots reports that it will "dart at birds, dogs and even butterfly collectors."

IMPORTED CABBAGEWORM BUTTERFLIES *(Pieris rapae):* Were brought to North America in 1860. Since then they have spread across the Continent. They have become a pest on cabbage and other crucifers.

COMMON SULPHUR *(Colias philodice):* Often seen swarming around mud puddles. The larvae feed on clover, alfalfa and related plants.

DOG-FACE BUTTERFLY *(Colias cesonia):* Fairly common in the South, this butterfly is rather rare in New York. Its caterpillar feeds on clover and false indigo.

BLACK SWALLOWTAIL *(Papilio polyxenes asterias):* Commonly seen in meadows and along open roadsides. Its larvae is sometimes a pest feeding on carrots, celery and related plants.

GIANT SWALLOWTAIL *(Papilio cresphontes):* Our largest butterfly. It is found in the southern parts of New York. The caterpillar, known as the orange-dog, is sometimes a pest of citrus trees. Prickly ash is its host in this State.

TIGER SWALLOWTAIL *(Papilio glaucus):* Frequently seen visiting garden flowers. Its larvae feed on many trees.

SPICE-BUSH SWALLOWTAIL *(Papilio troilus):* Also is often seen at flowers. The larvae feeds on spice bush, sassafras, and prickly ash.

ZEBRA SWALLOWTAIL *(Papilio marcellus):* Found in parts of the State where its host, pawpaw, occurs.

PIPEVINE SWALLOWTAIL *(Battus philenor):* Larvae of this butterfly feed on wild ginger and pipevine.

Skippers

FROSTED SKIPPER *(Achalarus lyciades):* Skippers are not considered to be true butterflies, but are placed between the butterflies and the moths. The Frosted Skipper is common. Its swift, somewhat jerky flight is typical of the family. The caterpillar feeds on leaves of tick trefoil.

LONG TAILED SKIPPER *(Urbanus proteus):* Is a southern Skipper known in this State only from the New York City area. Its larvae is a pest of beans and related plants.

THE CORTLAND HATCHERY

ON the edge of a grove of pines a few miles east of Cortland there stands a small fish hatchery. Comparatively few anglers know of its existence, yet its work has influenced trout culture the world over. The Cortland Hatchery is research experiment station, training school and production hatchery all rolled into one.

If you are a farmer you are aware of the contribution that research on livestock nutrition has made to the practical production of chickens, cows or pigs. If you are engaged in any business you can appreciate that an expenditure of thousands of dollars for fish food in New York hatcheries is a matter of some concern and warrants continuous research directed toward reducing costs and increasing efficiency. And if you are just an angler, you want to see healthy trout produced; not fish weakened by nutritional deficiencies.

The Cortland station represents an intelligent pooling of effort by three agencies toward solving of some of these nutrition problems. The U. S. Fish and Wildlife Service constructed the hatchery and maintains most of the personnel and physical facilities. Cornell University makes available its facilities in science and library. The Conservation Department stands part of the expense for personnel. What Cortland does is known in part through its publications, but these are of interest mainly to technical workers actively engaged in fish culture or research.

Special techniques and tests are being used at Cortland to investigate problems of trout nutrition and physiology, including chemical analysis of the body and blood to find out just how food is converted to produce trout flesh. As a result of these studies, it has been shown that trout, to be in good condition, must have no fewer than nine different B vitamins in their diet; that trout can utilize all the basic food groups—fats, carbohydrates and proteins. These findings have greatly improved the ability of trout culturists to provide a better balanced diet at greatly reduced cost—and produce better trout in the bargain. And in the course of these studies at Cortland some other money-saving "wrinkles" have been turned up, including improved methods for transporting trout and ways to use more efficiently hatchery water supply.

Fisheries workers have always been handicapped by a lack of suitable methods for the determination of the role of minerals in trout nutrition: How much calcium do trout receive from the water? Are dissolved minerals important in trout physiology? Does the mineral content of the water affect the survival of trout? Such questions have led to the establishment at Cortland of a special laboratory for use of radioactive "tracer" elements. Since radioactivity is always dangerous, special techniques and precautions are necessary; the workers must be protected by two-inch steel shields at times to prevent over-exposure, and the laboratory is operated as an aseptic bacteriological laboratory. This means, among other precautions, no smoking, eating or even touching the face with the hands while experiments are being conducted. Rubber gloves and protective clothing are worn when handling the radioactive elements, and these clothes are removed before leaving the laboratory.

Radioactive isotopes of various elements are followed by standard methods involving the use of Geiger-Muller scalers, by means of which the rapidity of the absorption of the element by the trout, and its distribution within and elimination from the body of the fish can be readily measured. A radioactive element shoots off little particles which are automatically recorded when they hit the tube of a "G-M" scaler. The number of particles that are recorded represent the number of atoms of the mineral under study that have been absorbed. This work has contributed and will continue to contribute much basic information applicable not only in hatcheries but to trout management in natural waters.

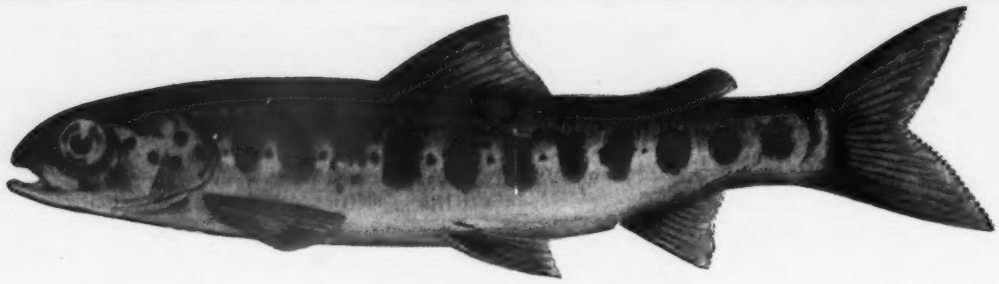
In a technical and complicated field of research such as fish nutrition a situation of "compartmentalized" knowledge is always likely to develop. This is that complicated and unproductive state of affairs were only the scientists working on a specific problem can understand it—or each other. It is pleasant to be able to report that this is not the situation at Cortland. Every year the Fish and Wildlife Service sends a number of fish hatchery "trainees" to take a special course (and many of our own hatchery men have taken it too). The Cortland staff has developed to a high degree the knack of talking science in understandable term—which, of course, is of great help in making research findings available and effective to the practical fish culturist.

Much of the physical plant at Cortland constitutes a production hatchery. Although space and fish are provided for feeding experiments and other scientific tests, most of the trout production is geared to the filling of Fish and Wildlife Service applications for fish stocking, and the fact that scientific research does pay in practical application is demonstrated by the steady rise in production figures at Cortland. With its limited water supply, production of 6,000 pounds of fish seemed a good mark in 1940. In 1955 the production in the same water supply was 18,000 pounds.

ESTABLISHED in 1932 as a research station, training school and production hatchery, Cortland is doing an outstanding job in all three fields. Many eminent fish culturists, nutritionists and physiologists have contributed to its success, and the Conservation Department's contribution, though relatively small, has been returned many fold in practical benefits to our own fish hatcheries.

—JOHN R. GREELEY, *NYSCD*
—ARTHUR M. PHILLIPS, JR.,* *USF&WS*

* For his work at Cortland, Mr. Phillips recently received a citation for distinguished service signed by the Secretary of the Interior.



Atlantic salmon, parr stage

Landlocking Atlantic Salmon

ON the first day of April, which is traditionally an unbelievable day, a strange event took place in Lake George—fishing for Atlantic salmon through holes in the ice. According to reports, at least one was taken but the lack of any open water somewhat hindered the salmon in their usually active co-operation with those hardy anglers known as "season-openers."

This lake, which grows some beautiful so-called "landlocked salmon" seems to be accepted by naturalized Atlantic salmon as a satisfactory substitute for their customary ocean habitat. Shapely fish with small heads and large bodies, they show the effect of a good food supply and grow to maturity. In this and other New York lakes, landlocking the Atlantic salmon can and has added a new angling attraction. Capture of salmon through the ice is of course unusual, but taking them by more conventional methods (including fly, spinning lure, trolling spoon or nautral bait) is getting to be an old story in Lake George and Schroon Lake. And a growing number of other lakes are showing up forerunners of what is hoped will be dependable salmon fishing. Salmon in New York are definitely on the up trend. How has this happened? And what are the chances of further increase?

Before going into these questions it seems desirable to clear up a common misunderstanding as to what is meant by landlocked and/or Atlantic salmon. For years this issue has been beclouded by conflicting judgments similar to those handed down by officials in a T-V boxing bout. Opinions have varied: Some consider salmon from lakes of Maine, from waters of Quebec, and from the Atlantic ocean as *three* distinct species; others, designate all of them as *one* species, *Salmo salar*. Majority opinion has now swung over to the latter group, although it is recognized that over the wide range of Atlantic and/or landlocked salmon, there may be numerous localized "races." But attempts to recognize certain of these as subspecies seem unsound.

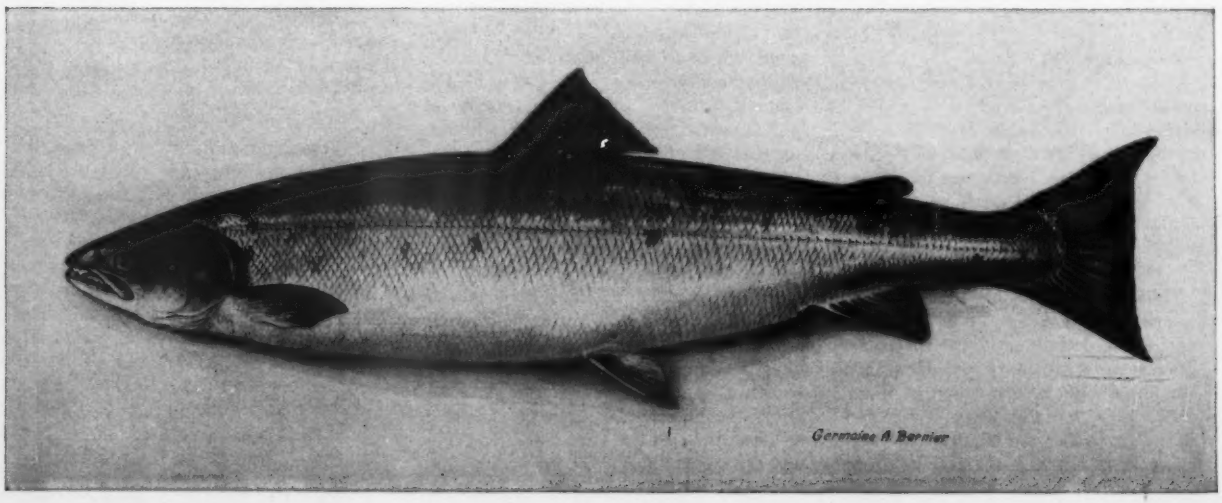
In New York lakes a long period of introducing salmon (dating back into the 1880's) resulted in establishment of breeding populations of a limited number of individuals in only a very few waters. Unfortunately, the egg supply used in early introductions from Maine included fish from both native landlocked populations and sea-run populations, with the result that we do not know the precise origin of our breeding stock. Regardless of origin, however, these salmon have not proven very successful in breeding in our waters.

This point, which is an important one since it bears upon our management program, merits further analysis: We know stocking of salmon can be quite successful,* but we must consider the two related problems of natural spawning and survival from stocking.

Salmon are fish of large lakes, or of the ocean. But it has long been known that they cannot spawn successfully in lake or ocean, and that when the time comes they can reproduce only in certain types of streams which must serve not only as breeding grounds but must also carry the young for a long period—usually two years, or until the "smolt" stage.

* Reports of early-season catches from Lake George and Schroon Lake encourage us to think this may be the best year thus far for salmon fishing in New York.

Female Atlantic salmon



Atlantic salmon, smolt stage

The "smolt" stage in the life history of salmon is reached when the immature fish (usually 4 to 8 inches and averaging about 5½ inches) turns bright silvery. In short, it begins to look and act like a salmon. (Previous to this the young, known as a "parr," look and act more like young brown trout.) From early Spring to early Summer the smolts move out of the streams into ocean or lake. Studies indicate that migration stops during Summer low water.

This situation of a short, Spring migration period of young salmon may be likened to catching a train. We all know that if we miss a train there is likely to be a long wait for the next one, and there is reason to conclude that if a salmon parr is just a little too late in changing to a smolt he will have to wait until the following Spring to migrate downstream. Only under the best of conditions will salmon become smolts in the Spring of their second year; many must stay another full year in the streams, and some even longer.

This unusual requirement of time, food and space for production of smolts in quantity pretty well explains why natural reproduction of salmon in our waters is inadequate. Even fairly large streams (the Schroon River is a good example) fail to carry enough salmon to the all important smolt stage. By planting we might be able to remedy this situation to a considerable extent, but results indicate that successful planting of streams must be designed to produce a good crop of smolts; nothing is to be gained by planting small salmon in streams unless these streams will carry and grow the fish until they are capable of successful migration into a suitable lake.

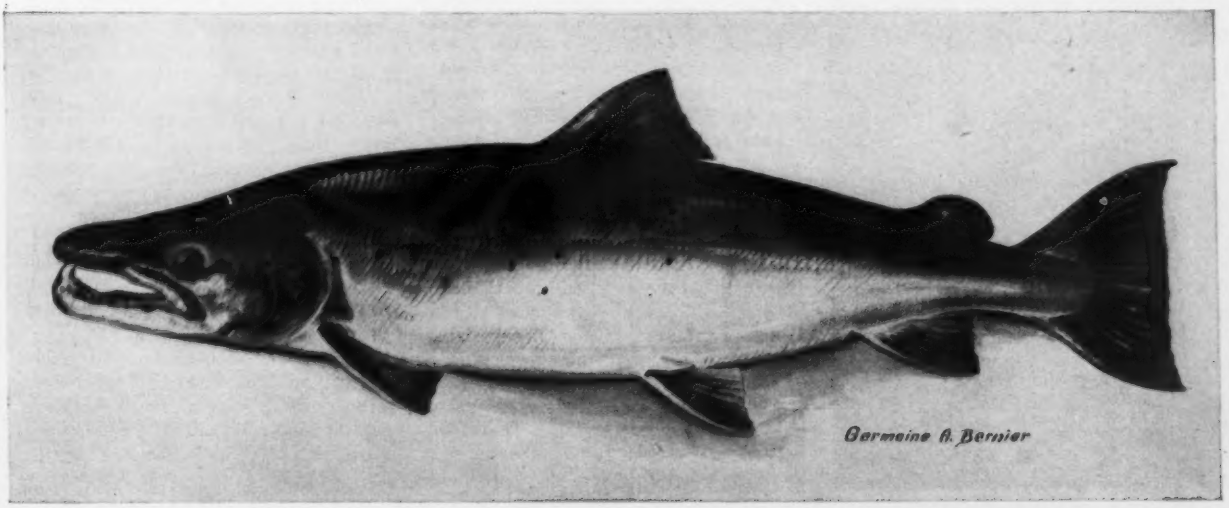
On the basis of experiments we conducted in Huddle Brook, a tributary of Lake George, 5½-inch yearling salmon (smolts or nearly so) migrated in a ratio of 40 to 1 as compared with migrations of 3½-inch yearling salmon (mostly parr) planted during the same Spring. There is additional evidence (from planting experiments in other streams) that large yearlings, planted during the Spring abundance of food in streams, will soon become smolts and migrate, while salmon too small to become smolts in the year when planted must take their chances on staying a full additional year — through critical low water periods.

Hence, results depend upon the quality of the stream: Small salmon, planted as Fall fingerlings or Spring yearlings, are capable of survival to the smolt stage only if the stream has a good year-round carrying capacity; unfortunately, such streams are the exception rather than the rule in this State.

So we feel justified in making this conclusion: That in experimental stocking of salmon in streams our aim should be to produce more large yearlings. This would make possible the successful planting of many more tributaries, and furthermore, if salmon smolts can be produced in the hatcheries, direct stocking of lakes can be undertaken with excellent chance of success.

Both stream planting and lake planting are being used in the present experimental management program. The initial plantings, to test the salmon producing potentialities of waters where these are unknown, are made on a relatively small scale. Later, checks are made wherever practical by means of electric shocker, observations or test netting. And through publicity in this magazine or elsewhere, we have repeatedly requested anglers to report exact information on salmon they have taken, including scale samples and measurements from which we can determine the growth rate.

Male Atlantic salmon



Color plates from "Canada's Atlantic Salmon," by F. H. Wooding, published by Dept. of Fisheries of Canada, Ottawa; acknowledgment to Dept. of Fisheries, Quebec for use of colored plates from paintings by Madame Bernier-Boulanger

The practical application of information resulting from experimental plantings is relatively simple: If results are good, we go ahead and expand our activities along the lines indicated. If results are hopelessly bad, we give up. If results are somewhere between these two extremes, we explore alternative management methods which may or may not pay off.

Marking of fish by fin clipping has been an important tool in evaluating various planting methods; such marking enables us to tell where the fish came from, and how they are doing. Reports on salmon by anglers should, if possible, be accompanied by information either that all fins were normal or that a specified fin was missing or abnormally short. The usual fins clipped are the adipose, left ventral or right ventral.

From the many letters received from salmon fishermen who *do* report catches (and we wish there were more) it is evident that they are interested in the future development of better salmon fishing. So are we. Last year some encouraging catches, made in the Fulton Chain, were reported to us, and as a result planting was expanded during the present season. And experimental plantings have been made in a considerable number of waters—including Cayuga Lake, Owasco Lake, Otsego Lake, Neversink Reservoir, West Branch Croton Reservoir, Sacandaga Reservoir, Saratoga Lake and a considerable number of Adirondack lakes. The first recapture of salmon from any of these experimental stockings will be big news, and we're waiting to hear from you. We know now that the establishment of salmon in many of our lakes and streams is possible. But we are still feeling our way, and of all the ingredients necessary to make such a program successful, the most important is public interest and co-operation. We have done and are doing the research and experimental work, but we depend largely upon you to give us the information about fish taken, which will prove or disprove our efforts.—JOHN R. GREELEY, *Chief Aquatic Biologist*

And speaking of Salmon: here's a new State Record

Edward Sullivan of Glens Falls with the State's record salmon. Note that the left ventral fin of the smaller fish is missing, having been clipped by Department personnel in order to classify the fish in case of subsequent recapture.

ON April 27, Edward Sullivan of 107 Glen Street, Glens Falls, wanted to try out his outboard motor, even though the ice was not fully out of Lake George. He thought he might as well wet a line while fiddling with his motor, and trolled with a streamer fly. This was a good idea, resulting in two salmon. The one on the right in the photograph, 31½ inches long, weight 12 pounds, 12 ounces, is the New York State record for landlocked salmon. The other salmon, 27 inches long, weight 6 pounds, 13 ounces, is just a nice fish.

Examining these salmon, Mr. Sullivan found each had a tag on its jaw. The big fish (tag 4H24) was netted November 20, 1954, during the annual spawn-taking work carried on by the Conservation Department. A ripe female, it contributed its share of eggs. At that date it was 27¾ inches long and weighed 7 pounds, 15 ounces. The smaller salmon (tag 4H12), also a ripe female when netted in 1954 (November 15), was at that time 25 inches, 4 pounds, 3 ounces.

Further examination of the fish showed the left ventral fin of each to be missing. (Close examination of the photograph will show the scar of missing fin on the smaller fish.) This left clip, supplemented by age checked from scale samples, identifies both salmon as having been planted in April, 1951 in an experiment to test Canadian Atlantic salmon against landlocked salmon from New York waters. (Subsequently it was found that both types of salmon, which look exactly alike, have been very successful.) These two happen to be real landlocks from our own eggs. Both fish were six winters old this Spring, the first Winter being spent at the Washington County hatchery (Cambridge).

All of this tabulation of information from clip marks, age readings and tagging is more or less routine. But, catching two salmon with the same clip mark, also tagged in the same year, is just about as far from a routine procedure as you could get. And when one salmon is a dozen pounds and a dozen ounces—well, this makes chances of duplicating the feat even slimmer.

We can't help wondering what strange things might have happened if Mr. Sullivan had really set out to make a day of fishing instead of just doing a little trolling while he tested out his motor.

Another unusual circumstance about these two salmon is the fact that comparative scale samples are available for study: One taken in November, 1954, at the time the fish were netted for stripping and the other taken when the fish were caught on April 27, 1956. This type of information is very useful in helping solve the mystery of why some salmon grow faster than others.

Both of these fish were about the same size at planting and both show one additional year of slow growth, characteristic of life in the type of tributary streams used for planting salmon. After migration into Lake George after the second Winter both salmon grew rapidly for two years before maturity, but the scales of the 12 pound, 12 ounce fish show that it grew unusually fast during these two years. (As indicated from the weights when these two fish were handled in November, 1954, it was even then well ahead.) After beginning to spawn both fish grew much more slowly.

Through the co-operation of anglers like Mr. Sullivan we are learning more and more about salmon growth. We hope you will measure your salmon and send in a dozen or two of its scales.

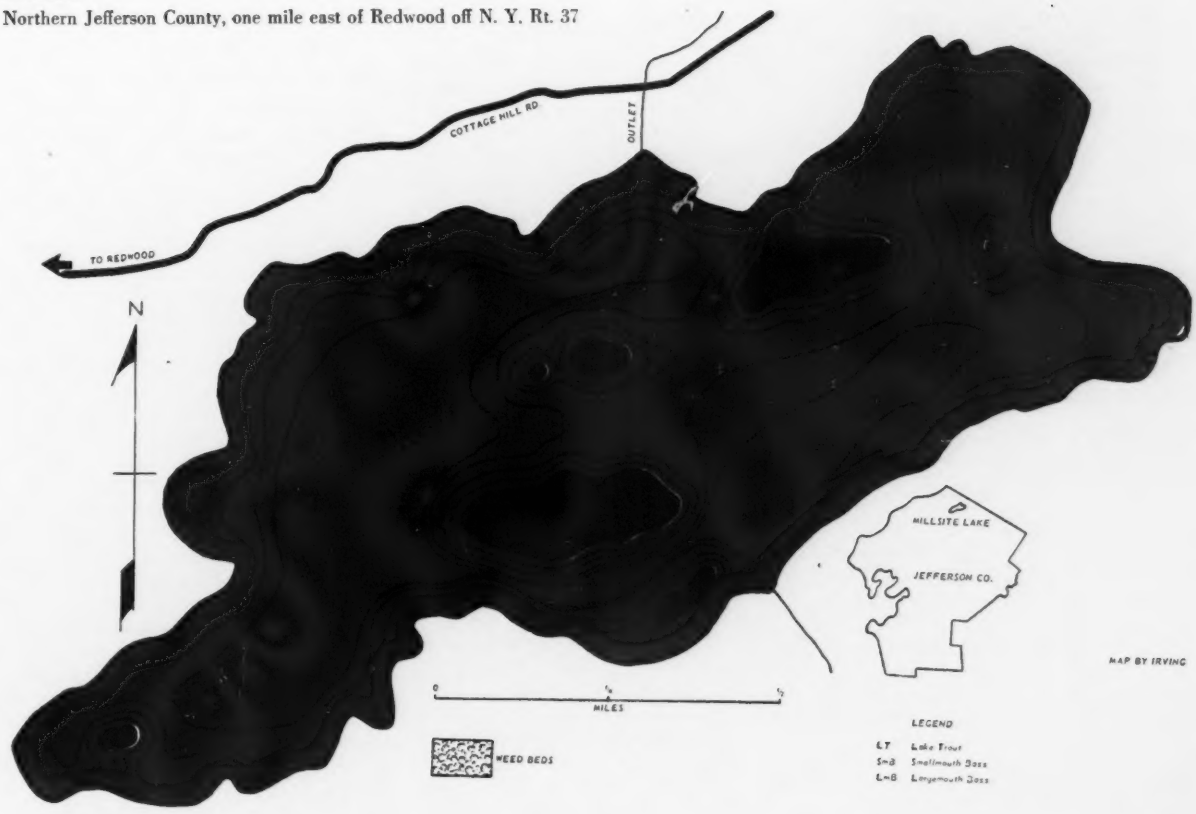
—JOHN R. GREELEY

Dept. of Fisheries of Canada, Ottawa; acknowledgment to Dept. of Fisheries, Quebec for use of colored plates from paintings by Madame Bernier-Boulanger

Millsite Lake

Location

Northern Jefferson County, one mile east of Redwood off N. Y. Rt. 37



Physical Features

Area: 499 acres
Elevation: 301 feet
Maximum Depth: 76 feet
Shore: Precipitous and wooded
Water: White and clear

Chemical Data

pH: 6.9-7.5
Dissolved oxygen: 8.0-10.6 Ppm, good at all depths

Fish Present

Lake trout	Yellow perch
Rainbow trout	Rock bass
Cisco	Bullhead
Smallmouth bass	Common sunfish
Largemouth bass	Bluegill sunfish
Northern pike	Golden shiner

General

Millsite Lake is one of several lakes located within a five-mile radius. These lakes are capable of providing good fishing for many of the species of game fish found in New York. Millsite provides fair to good angling for smallmouth bass, largemouth bass, lake trout and panfish.

At one time this cold water lake provided fair fishing for rainbow trout and in 1955 the Conservation Department again began stocking this species. Last year, 4,200 yearling rainbows were stocked, and they should be a foot or more in length by this season.

Ciscoes were found to be abundant when the Department first surveyed the lake in 1931. They were still abundant when Millsite was re-checked in 1952 and should furnish some good fishing. As in Owasco Lake in central New York, it's probable that the ciscoes could be taken by casting wet flies along shore in late Spring or early Summer —when this fish moves into shallow water.

Lake trout is another species in Millsite that could stand more attention from fishermen. For at least 25 years, the Department has annually stocked more than 6,000 fingerling lakers but only a small fraction of that number are taken.

Nimrods are advised to look elsewhere for good hunting. The Millsite Lake area produces only fair hunting for deer, ruffed grouse, snowshoe rabbits and woodcock.

Tourist accommodations and a boat livery are present on the lake. Rooms, cabins or cottages are also available in nearby Redwood. An access road to Millsite Lake, owned by the Jefferson County 4-H Club, has been made available to the public to launch boats as long as the privilege is not abused and proper respect is shown in use of the land and surrounding property.

—W. A. PEARCE, *Aquatic Biologist*

the back of the book

Freak trillium

Along a line roughly paralleling the south and east shores of Lake Ontario and swinging up into Ontario near Niagara Falls and west into Michigan the white trillium, *Trillium grandiflorum*, may show a freakish coloring. This is apparently due to a disease or virus that seems to be stimulated by some mineral factor of the soil in these areas; possibly the salt.

The flowers shown here were photographed by Theodore Langie near Victor, N. Y. and suggest a rather solitary occurence of the condition in that area. Very often, however, if one such specimen is found there may be hundreds or even thousands nearby, basically showing the same color, but individually marked.

For sale

A recent advertisement in a Missouri Farm Journal read: "For Sale—One Buchanan County farm, bottom half located in Buchanan County, top half somewhere between here and the Gulf of Mexico, filling up the Missouri River bed so as to cause more frequent floods, when it rains again. Minerals are gone with the surface.

"One empty house, doors and windows missing, lean-to, 2 rooms and a path. One silted up pond. One leaning barn to be moved. Fifty bales mixed grasses, mostly tickle grass and giant foxtail. Four mineral deficient cows. They are gentle, guaranteed to have rickets and no calves. One-quarter mile of fence, buckrush, sumac and bailing wire. One sow and two pigs—would eat anything. Seventeen hens, used to roosting in treetops. Farm is guaranteed to produce headaches, overdrafts and foreclosures. Other articles too worthless to mention.

"Reason for selling—owner going to work for conservation farmer who has taken care of his soil."

We got it

Miss Harriet Kaufman, 781 Parkway Drive, Roslyn Heights, New York got prompt service. On the back of her envelope addressed to this Department requesting bulletins and circulars, she had this notation to the Postman:

"To the Postman:
"D-liver
"D-letter
"D-sooner
"D-better
"D-tails inside."

We took care of the "d-tails inside."

Rabbits and Spring

If any further evidence were needed that Spring was late this year, Albany County cottontails provided it. They were three weeks later than the previous year in their housekeeping activities.

Road-killed rabbits from Albany County highways furnished the evidence. Of 42 female rabbits killed during the period March 19 to April 26 only 15 were carrying embryos. Of these, 11 had mated successfully between April 2 and 6. Only one successful mating in March (the 26th) was recorded. Mating dates were determined by subtracting the age of the embryos from the date of death.

Last year all but one female examined in April either were carrying young or already had given birth. Over half (15) of the 27 females carrying the embryos whose ages could be determined had mated successfully in mid-March. A second peak of successful matings occurred the first few days in April.

This year's delayed breeding activity need not be viewed with alarm by the rabbit hunting and beagling fraternity. Adverse weather conditions are often fatal to rabbit nestlings the first two weeks of their life; flooding of nest sites, chilling, suffocation of young under a mantle of snow, and inability of the female to find and nurse nestlings covered by newly fallen snow often wipe out a sizeable proportion of early Spring production. So, while the delay in the breeding season may decrease by one the number of litters produced by some females, the chances of survival of young in these first litters should be considerably better than if they had been born at earlier dates typical of recent seasons.—Jos. DELL

Public campsite expansion

Moving forward with Commissioner Wehle's program of public campsite expansion, the Conservation Department's Bureau of Camps and Trails has a busy season ahead.

At Rollins Pond Campsite, about 12 miles east of Tupper Lake, the Bureau expects to have 200 additional camping sites ready for use by July 1 this year. At Hearthstone Point Campsite on Lake George 25 additional sites will be in readiness this season, and an additional eight new sites at the Lake George Battleground Campsite.

At the same time, construction is scheduled to begin this year to develop a new 120-site campsite and a lake at Macomb Reservation near Schuyler Falls.

A new headquarters building will be begun at the Duck Hole Campsite on the Northville-Placid trail; at Thacher Park, parking and picnic facilities will be expanded; and at Belleayre Ski Center in the Catskills work will be started this season on a new ski lift to better serve the overflow crowds at this popular Winter and Summer resort.

Lest you forget

Date: March 26, 1956. Place: A mountain road through Forest Preserve lands, Greene County. Snow Depth: 60 to 100 inches. Forest Rangers Schrader and Showers, who took the picture, state this was not a drift but the average snow depth across the whole top of the mountain.

Timber sales on State Forests

While State Forests have only just passed their 25th anniversary since the start of the program in 1930, timber sales of forest products are increasing in demand insofar as District No. 1 (Otsego, Delaware, and Schoharie counties) is concerned.

Continuous sales of sawlogs has been going on since 1949, and while not large, they indicate a trend in the future management of State Forests. Currently, two sales are in progress, and will net about $8,000, and additional markings and sales will be made this coming Summer. Average sales so far comprise about 160 M board feet of timber per sale.

A pulpwood sale of approximately 100 cords of larch is also just getting under way. This larch was planted in 1932 and the largest trees now measure 15″-17″ stump diameter. Arrangements have been made by the logging contractor to dispose of this product to the International Paper Company.

In addition, 10,000 posts derived as thinnings to forest plantations have gone to county highway departments for guide rail posts, to various parks and campsites for making up table and bench combinations, and for use as fence posts. These products were valued at $3,500.

Good hardwood timber lots are increasing in demand, and while many outsiders scoffed at the State's policy in the early days of land acquisition, indications are that timber sales from State Forests will become increasingly popular and a profitable venture for the Department.—R. M. Hick, *District Forester*

Mushrooms a la sawdust

Do you like mushrooms? Are you tired of tripping over that pile of sawdust? Do you have plenty of oatmeal? If the answer to these questions is yes, then you're all set (according to Dr. Seymour S. Block, Professor of chemical engineering, University of Florida) to grow up to 500 pounds of tasty mushrooms in eleven days on a ton of dried sawdust sprinkled with oatmeal.

Dr. Block points out that mushrooms grown in a compost of manure and straw, the usual practice, will produce only two or three crops a year whereas the sawdust beds, with a 5 per cent oatmeal dressing, can produce a dozen full crops. Besides, he says, the sawdust is easier to handle and mushrooms will sprout at ordinary room temperatures up to 78 degrees, whereas present commercial growth is limited to 50 to 60 degrees.

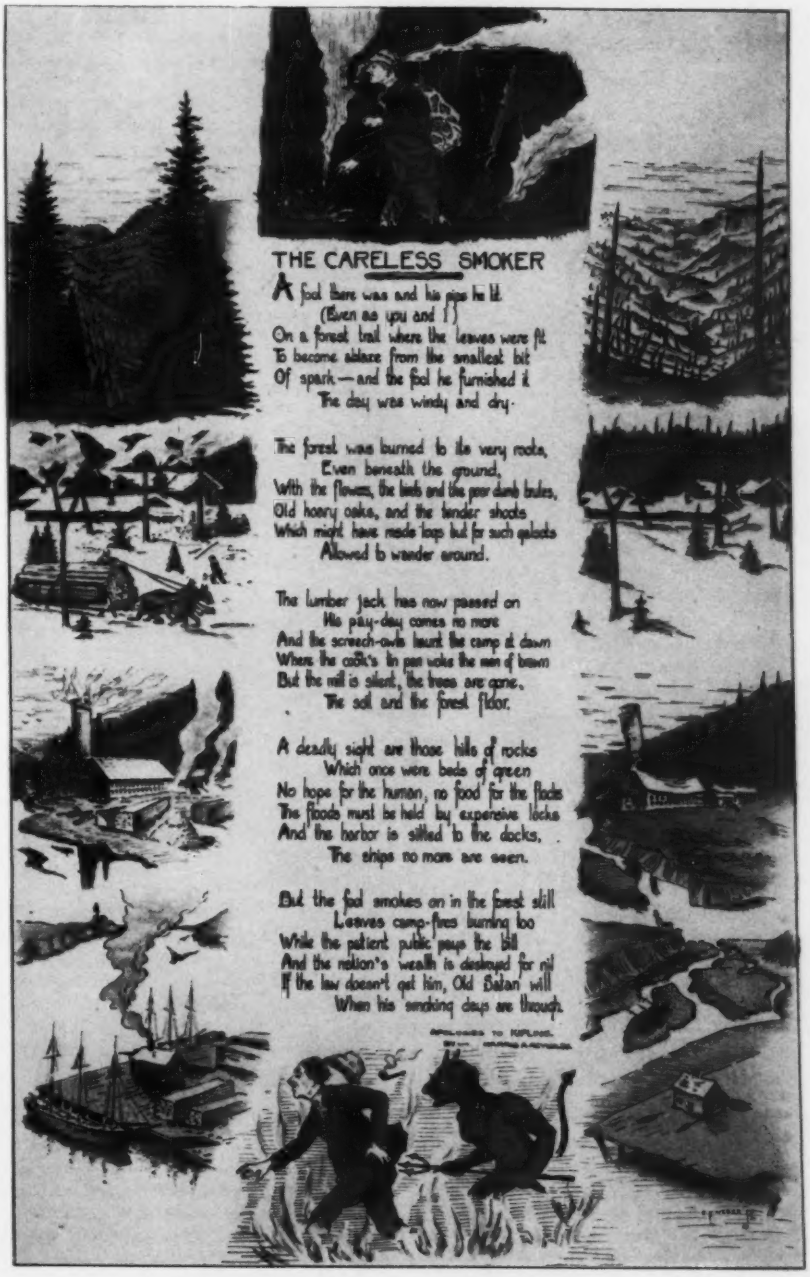
We are fresh out of sawdust and oatmeal. So for details we recommend inquiry to Dr. Block, University of Florida, Gainesville, Fla.

Forestry awards for 4-H

American Forest Products Industries, Inc. recently announced it will again (for the ninth year) sponsor forestry awards to 4-H Club members throughout the Nation.

Working with the State Extension Service and the U. S. Department of Agriculture, the corporation will offer twelve all-expense trips to the 35th National 4-H Club Congress to be held Nov. 25-29 in Chicago, Ill. County and state prizes will also be awarded.

The objective of the contest is to inspire leadership, under the 4-H program.


THE CARELESS SMOKER
A fool there was and his pipe he lit
(Even as you and I)
On a forest trail where the leaves were fit
To become ablaze from the smallest bit
Of spark—and the fool he furnished it
The day was windy and dry.
The forest was burned to the very rocks,
Even beneath the ground,
With the flowers, the birds and the poor dumb brutes,
Old hoary oaks, and the tender shoots
Which might have made logs but for such galoots
Allowed to wander around.
The lumber jack has now passed on
His pay-day comes no more
And the screech-owls haunt the camp at dawn
Where the cook's tin pan woke the men of brawn
But the mill is silent, the trees are gone,
The soil and the forest floor.
A deadly sight are those hills of rocks
Which once were beds of green
No hope for the human, no food for the flocks
The floods must be held by expensive locks
And the harbor is silted to the docks,
The ships no more are seen.
But the fool smokes on in the forest still
Leaves camp-fires burning too
While the patient public pays the bill
And the nation's wealth is destroyed for nil
If the law doesn't get him, Old Satan will
When his smoking days are through.

It was true then—it's still true today

A forest fire control poster widely distributed in the early Twenties. It was the inspiration of the late Harris A. Reynolds, at that time the Secretary of the Massachusetts Forest and Parks Association.

Louis Agassiz Fuertes:

His Life Briefly Told and His Correspondence Edited, by Mary Fuertes Boynton. Oxford, 317 pages, $7.50. Illustrated with black and white photographs and field sketches.

This book traces the life of Louis Agassiz Fuertes from his childhood in the 1880's as the son of a Spanish-born professor of civil engineering at Cornell University, through his development as the world's greatest bird painter to his sudden death in 1927. His daughter, Mary Fuertes Boynton, has carefully edited the Fuertes correspondence linking the letters with her personal notes of explanation. How he was discovered and helped in his career by Abbot Thayer, one of the leading painters of the day, by Dr. Elliot Coues, Dr. Frank Chapman and others is told largely through letters written to Fuertes.

Early in his career as a wildlife painter, Fuertes realized that he must work from live or fresh models. In achieving this he traveled with expeditions to many parts of the world, from Alaska to Central America and Africa. Letters he wrote while on these trips make up the bulk of the book. The artist's ability to be sympathetic to and thrilled by his surroundings makes these letters exciting reading.

It is unlikely there will ever be another bird painter to equal Louis Agassiz Fuertes. In his lifetime he personally advised many young wildlife painters, and his work has inspired many more. There are those in conservation work today who were originally motivated in their choice of profession by his paintings.

Readers interested in knowing the warm personality behind a great talent will find this book well worthwhile. It is unfortunate that more examples of Fuertes' drawings and paintings (see page 17 of last issue) could not have been included. For those desiring to find examples of his published pictures, however, the appendix listing of these will be valuable. —H. WAYNE TRIMM

Wanted—March meals

If you know of a wild apple, crabapple or hawthorn in your area whose fruits persist on the branches in some numbers until late February or March, we would like to know about it. Our game birds usually can find plenty to eat in the Fall, but when Winter snows bury the fallen fruits and seeds out of reach, the fruits that hang high in Nature's pantry assume considerable importance.

Persistence of fruit is usually a characteristic limited to individual shrubs or trees, so that these must be propagated by grafts or rooted cuttings, rather than by seeds. Please send the desired information to Ralph H. Smith, Wildlife Research Laboratory, Delmar.

The Saltonstal-Kennedy Act

The U. S. Fish and Wildlife Service recently strengthened its hand in its current study of striped bass along the Atlantic Coast. Aid came in the amount of $32,000, appropriated under the Saltonstal-Kennedy Act of 1934.

The money is being used to study various aspects and effects of commercial fishing for striped bass. This study augments others on the striper being conducted by Atlantic coastal states and the F. & W. L. Service.

The Saltonstal-Kennedy Act provides up to $3 million annually for studies designed to aid domestic commercial fisheries. West Coast studies now in progress under this fund include investigations on Pacific salmon, sardines, anchovies, mackerel and tuna.

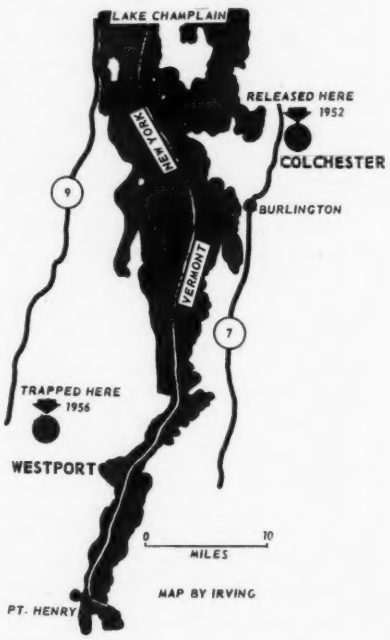
P-R, D-J threatened

If a bill introduced recently in Congress by Senator William Langer, North Dakota, should pass, the Pittman-Robertson and Dingell-Johnson Federal aid in wildlife programs would be dead.

Langer's bill would repeal all Federal retailers' and certain manufacturers' excise taxes on sporting arms, ammunition and fishing tackle, depriving the states from sharing in appropriations from such funds.

These twin programs in fish and game conservation have been the life blood in acquisition of public hunting lands, fishing rights, fish and game research and management throughout the country—directly responsible for much of the progress made during recent years in wildlife conservation.

We feel confident that the forthcoming Crosley report on the nation-wide survey of sportsmen expenditures for hunting and fishing will more than justify the investment in the conservation and development of our natural resources made possible through these Federal programs.



Non-resident beaver

Forty miles in four years is hardly a speed record, but when it involves a beaver, two states and Lake Champlain it is, at any rate, one for the books. For *this* book, anyway.

The beaver, with a Vermont Fish and Game Service tag in its ear, was trapped this Spring near Westport, N. Y. by Ellis Brant of that village. Game Protector Paul French of Elizabethtown, to unravel the mystery, wrote the Vermont Service and learned that the errant beaver had been live-trapped near Colchester, Vt. on December 12, 1952. He was fixed up with an ear tag and popped into Mill Pond, Town of Colchester, only to turn up again this Spring about forty miles away, across Lake Champlain in New York State. Where all he has been in the meantime is anybody's guess.

A toothsome smile

This 'chuck was doomed even though he had escaped the unlikely fate of being hit by Wayne Trimm's arrow. Because its incisor teeth failed to properly meet (one had already penetrated the roof of the mouth), it would sooner or later have been unable to feed and would have starved.

Woodchucks and carp, incidentally, make sporting, off-season targets for archers interested in keeping their eyes sharp for the hunting season.

Management for State Forests

The Bureau of State Forests will shortly commence field work on the making of management plans for each State Forest in Districts No. 1, 2 and 8 (Delaware, Otsego, Schoharie, Broome, Chenango, Madison, Oneida, Herkimer and Montgomery counties). This has come about with the completion of a study of management plans made by District Foresters Chas. A. Baker, Albert Woodford and R. M. Hick.

The management plan will give the complete history of each forest since its acquisition by the State, its uses for forest products, wildlife management, recreational possibilities, and a complete inventory of the growing timber in each stand. In conjunction with the management plan study, the Bureau is constructing volume tables for all plantation species of trees planted in State Forests since 1930. These volume tables will be a valuable contribution to forestry, and could very well become a standard for computing volumes of plantations of various ages in New York State.

This will be a "pilot" operation, and when field procedures have been finally adopted, the work will be extended to include all districts having State Forests in their jurisdiction.

Great Lakes fisheries

On December 11, at Purdue University, Lafayette, Indiana, fisheries men of the New York State Conservation Department gathered with co-workers from the seven other Great Lakes states and the Province of Ontario for the 1955 meeting of the Great Lakes Fisheries Committee.

This group has long functioned as a medium for exchange of information on the status of the Great Lakes fisheries and a mediation board for coordinating scientific studies. In this connection, the 1955 meeting was particularly important in view of the recent, and long-awaited ratification of the Great Lakes Fisheries Treaty by the U. S. and Canada. (See CONSERVATIONIST, Dec.-Jan., 1954-55).

The U. S. Fish and Wildlife Service, touching on studies in progress on the Great Lakes, reported on the continued decline of the lake trout fishery in the upper lakes—commercial catch insignificant in Lakes Michigan and Huron—and a drop in Lake Superior from 3,784,000 pounds in 1953 to 3,472,000 pounds in 1954; a decline of 312,000 pounds.

With respect to control of lamprey eels, blamed by Service biologists with being chiefly responsible for the decline of the lake trout fishery in the Great Lakes, it was revealed that more than 4,000 toxic compounds had been tested in search for one that might safely be used to kill lamprey larvae—without harm to associated fish. Thus far, two have shown promise.

The Service also reviewed results of lamprey control on various streams tributary to the upper Great Lakes using electrical barrier devices. An increase of 79 per cent was found in the lamprey run in 1955 over 1954 in the test streams in Lake Superior.

8th generation woodlot

This well managed stand of white and red oak, white pine, basswood, ash and some beech is located on the Devendorf Farm, Town of Florida, Montgomery Co.

Devendorfs have owned and lived on this farm for eight generations according to District Forester A. J. Woodford, and Boyd Devendorf, present owner, has been a Forest Practice Co-operator since 1950. Since that time, Woodford reports, Devendorf has made selective cutting of 228,000 board feet of timber including 66,000 board feet of white pine sawed on the property with a portable mill.

Woodford says—and we agree—that it's no mean accomplishment for one family to live on and successfully operate the same farm for eight generations and still have a woodlot that is outstanding for timber quality.

The Coypu

Variously described as a big muskrat, a small beaver or the biggest rat in the world, the coypu is currently a subject of some concern to landowners and biologists on both sides of the Atlantic.

The coypu, or nutria as it's known to the fur trade, is a large aquatic, marsh-dwelling rodent whose home base is Argentina. Fur ranchers in the U. S. and in Britain have imported the animal in recent years and "escapes" now threaten to usurp muskrat habitat in some of our southern states, and in England, to jeopardize the sugar beet crop. The big rodent's doings in England were reported on recently by special dispatch to the *New York Times* as follows:

"Farmlands in the wet, low-lying regions of East Anglia are being invaded by large South American rodents called coypus.

"The animals, which normally feed on riverside vegetation, have become accustomed to a British way of life. They are destroying the local sugar beet crops by nibbling off the tops of the growing plants. In addition, they are flooding the land by burrowing deep into the banks of rivers and drainage canals.

"The invaders, known to zoologists as myocaster coypus, are rat-like rodents not unlike beavers in appearance. They weigh between 10 and 28 pounds.

"According to Dr. L. Harrison Matthews, director of the London Zoo, the full-grown adults are about two feet long from their heavily bewhiskered snout-tip to tail root. The tails usually add eighteen inches to their length.

"Major Anthony Buxton, a landlord at Great Yarmouth whose property is infested with the animals, says he believes the coypus 'are about to become a far worse menace than the gray squirrel,' another unwanted American immigrant.

"As the coypu has no natural enemies in Britain, it is feared that well-established colonies may build up rapidly."

In New York State, the Conservation Law now prohibits the importation of nutria except as may be permitted by the Conservation Department for scientific, exhibition or breeding purposes.

How does your grass grow?

Does your grass dry up and blow away, bake and die in the hot sun, wash out during heavy rains, waste away in the shade? Want to know why and what to do about it?

The best answers we have ever seen to these questions are set forth in the recently published final report of a three-year study conducted by the New York State Department of Public Works' Landscape Bureau. Co-operating in this research were agronomists and soil specialists at Cornell and Rutgers universities, assisted by a host of authorities.

Entitled "Roadside Vegetative Cover," the report discusses soil requirements, fertilizers, seeding—including the best varieties under varying circumstances and conditions, mulching and maintenance. The appendix contains tabular guides to liming, susceptibility of annual and perennial weeds to 2,4-D, use of hormone herbicides for killing brush, cost tables and other information.

We are informed that copies of this report are available at $1 each upon request to Henry A. Cohen, N. Y. S. Department of Public Works, State Office Building, Albany, New York.

Little bugs, big threat

Forest fire, the spectacular destroyer that once was forest enemy number one, has been shouldered aside by the lowly insect. In New York, foresters must keep a sharp eye on some 13½ million acres of forest lands to guard against severe damage by a host of insect pests including, among others, pine saw flies, white pine weevils, European pine shoot moths, forest tent caterpillars and gypsy moths.

This year the Department's Bureau of Forest Pest Control has been hard at work since May 1st aerially spraying nearly 80,000 acres of forest land to control the gypsy moth and another 80,000 acres in its continuing battle with the forest tent caterpillar and the saddled prominent caterpillar.

Mopping up the stars

Oysters in New York's Marine District lead precarious lives, and one of the reasons is starfish. They do tremendous damage to oysters, both young and old. As an example, a starfish less than a month old can destroy as many as six young oysters per day. They paralyze their prey with a poisonous secretion, then turn their own stomach inside out and insert it into the open shell of the oyster, where digestion takes place entirely outside the body of the starfish.

One of the most common methods of combatting the menace of starfish is to remove them with mops as illustrated in the above picture. These mops are made by knotting three to four foot lengths of cotton on a wire two feet long. As many lengths are put on each wire as it will hold and are kept on by rings or stops at each end. The cotton material used comes in long skeins and is soft and kinky. The size of the mops varies, but an average size is about four pounds of cotton per mop. The mops are fastened by short pieces of chain to an iron bar five to ten feet in length. The mops are then towed over the bottom and starfish are caught by becoming entangled in the threads. The length of time for which mops are towed depends on the abundance of starfish.

Hunting accidents

The National Rifle Association in a recent report on hunter casualties summarized information received from 36 states and provinces for the calendar year 1954. Hunter casualties are analyzed with reference to the age of the shooter, types of game hunted, types of cover being hunted, visibility, percentages of fatalities, types of weapon, etc.

Of particular interest is the N.R.A. analysis of the age of gunners involved in hunting accidents on a nation-wide basis. They report that 43 per cent were minors, 57 per cent were adults. In New York the breakdown in this category for 1954 was 29 per cent minors; 71 per cent adults.

We feel sure that the Junior Hunter Training Program, in effect here since 1950, is largely responsible for the better record by minors in New York.

Operation iceberg

The Winter of 1955-56 in New York will certainly win no popularity poll with man or most beasts. Diving ducks, however, were an exception. They spent a long and happy time in the larger open waters of the State and as a consequence Conservation Department co-operators shattered all previous records for live-trapping and banding these species.

More than 8,000 divers were live-trapped and banded during the Winter season at five stations in the State. Top honors went to Canandaigua Lake Duck Hunters, Inc. for their amazing total of 2,512. More than half (1,613) were redheads, followed by canvasbacks (792), greater scaup (81), lesser scaup (19) and a few ringnecks, buffleheads and coot.

Runner up this year was the Northern Chautauqua County Fish and Game Club. They trapped and banded 2,142 diving ducks during the season at their Dunkirk Harbor station on Lake Erie. Co-operators on Long Island banded 1,862 at Seneca Lake 1,794 and at Cayuga 512.

Boy Scouts and conservation

The conservation of natural resources and the Boy Scouts of America were recent mutual beneficiaries of a $50,000 grant from the Rockefeller Foundation toward support of a five-year conservation education program. Spurred by the success of the Scouts' 1954 Conservation Good Turn Program, (CONSERVATIONIST, August-September, 1954), the Foundation and the National Scout Council hope to further emphasize active Scout training projects in forest, soil, water, fish and wildlife management.

Ted S. Pettit, who headed the Conservation Good Turn Program, will direct the new program.

Hatchery production

For the fiscal year ended March 31, 1956, the State hatcheries turned out 487,864 pounds of fish. Of this poundage, 460,121 was trout and 27,743 warmwater fish including bass, muskalonge, pikeperch, and calico bass.

This is an increase of about 12 per cent over the previous year.

Fish salvage

The Conservation Department's fish salvage crews had, as of May 5 this year, netted 53,000 pounds of pan and game fish, mostly from waters closed to public fishing, and restocked them in open waters.

An important part of the early season program was stocking for kids' derbies.

Browns from Pepacton

For four years water has gradually been rising in the huge Pepacton Reservoir on the East Branch Delaware River as work progressed on the dam at Downsville. Early this Spring, ahead of general speculation, it was full to the brim and water began to flow over the spillway.

About the same time fishermen, working their way along shore, discovered that here was trout fishing the like of which they had only dreamed about. Shown above are four brown trout typical of those being taken this Spring in the reservoir. The largest shown was 21 inches long, weighed 4 pounds, 14 ounces.

But there was concern too, for many trout were found to have lamprey scars and some were taken with lampreys firmly attached. On the trout shown here lamprey scars are clearly visible on three of the four fish—yet it's hard to imagine trout in any better condition.

Department fisheries biologists are keeping a sharp eye on the lamprey situation but they aren't too alarmed at present. Sea lampreys have always been fairly abundant in the East Branch of the Delaware River, but they're abundant too in the Finger Lakes. In Seneca Lake, for instance, about 90 per cent of the lake trout netted each year by the Department for stripping have lamprey scars, yet the lake trout fishery holds up.

As to the future in the Catskill reservoirs, fisheries men expect a drop in the lamprey population. The Downsville Dam, they point out, will prohibit further upstream migration in the East Branch of the Delaware. This situation, coupled with the fact that lampreys, like Pacific salmon, die after spawning, gives hope that their days may be numbered.

Mabelle I. Gilman

Mabelle I. Gilman has worked for the Conservation Department longer than any lady employee in the Department's history—40 years. Since June, 1923 she has been secretary to the Secretary, and most of us have come to think of her as a permanent fixture in the Department.

Unfortunately, she's not; Mabelle retired on the first of June. Her friends here gave her a luncheon party that was attended by Commissioners, Deputy Commissioners and Secretaries both past and present, plus a host of the many other friends she has made over the years. In fact, this was probably the best attended party ever given in honor of a Department employee.

That's a pretty good indication of the way we feel about Mabelle.

Oneida walleyes

Department netting crews from the Constantia Hatchery on Oneida Lake were a month late this Spring in setting the big trap nets for spawning walleyed pike. Ice in the lake prevented netting operations prior to April 18 this year but the big pike, once started, came on with a rush, and by April 26 more than 3,500 quarts of eggs had been taken. With a capacity run in the hatching jars, netting operations were discontinued on that date, although spawning fish were still available for the taking.

Figuring it another way, the take this year amounted to 528,600,000 eggs. Hatched into pike fry, this is adequate to meet State-wide requirements for stocking.

A total of 20,072 pikeperch were handled during the spawn-taking operation. Female pike averaged approximately three pounds each, produced an average of 70,000 eggs.

If there were any skeptics remaining around central New York who, because of the fishing doldrums in Oneida Lake two years ago, were convinced that there were no more pike in the lake, they should now see their error. And the fishing season has added further evidence.

Club Note

From the Andrew H. Zimmer Conservation Club of Staten Island comes the following "do-it-yourself" contribution:

Ten Ways to Kill an Organization

1. *Don't go to the meetings.*
2. *If you do, go late.*
3. *If the weather doesn't suit you, don't think of going.*
4. *If you attend a meeting, find fault with the work of the officers and members.*
5. *Never accept office, as it is far easier to criticize than to do things.*
6. *Get sore if you are not appointed on a committee, but if you are, do not attend committee meetings.*
7. *If asked by the president to give your opinion on some matter, tell him you have nothing to say.*
8. *After the meeting tell everyone how things should have been done.*
9. *Do nothing more than absolutely necessary, but when other members use their ability to help matters along, howl out that the organization is run by a clique.*
10. *Hold back your dues or don't pay.*

Function of the Executive

As NEARLY EVERYONE KNOWS, an executive has practically nothing to do except to decide what is to be done; to tell somebody to do it; to listen to reasons why it should not be done, why it should be done by someone else, or why it should be done in a different way; to follow up to see if the thing has been done; to discover that it has not; to inquire why; to listen to excuses from the person who should have done it; to follow up again to see if the thing has been done, only to discover that it has been done incorrectly; to point out how it should have been done; to conclude that as long as it has been done, it may as well be left where it is; to wonder if it is not time to get rid of a person who cannot do a thing right; to reflect that he probably has a wife and a large family, and that certainly any successor would be just as bad, and maybe worse; to consider how much simpler and better the thing would have been done if one had done it oneself in the first place; to reflect sadly that one could have done it right in twenty minutes, and, as things turned out, one has had to spend two days to find out why it has taken three weeks for somebody else to do it wrong.

What price 'success'?

Michigan's 1955 deer hunting season was a success, if you consider only the fact that 68,000 bucks were taken by firearm hunters—about 9,000 more than during the regular season last year. And that —Hunters, apparently, were better satisfied. Only two written complaints had been received by the Conservation Department by Dec. 15, whereas over 200 had been received by that time last year.

They had, apparently, learned that the charge, that Michigan's deer herd had been slaughtered to extinction in the previous year's "any deer" seasons, was the myth the Game Division claimed it to be.

But *WAS* it a complete success?

Considering, that is, the cruel fact that an early winter with increasingly heavy snow has driven the deer into the already dangerously overbrowsed deer yards a month earlier than usual.

"If we have a late Spring we probably will lose a lot of deer. It could be bad. This may be the year we could get it," Game Chief Harry Ruhl told the Conservation Commissioners at their December meeting in Detroit.

If thousands of does, and yes, even fawns, die the lingering horrible death of starvation this winter instead of being harvested by hunters, as in previous years — *WAS* Michigan's 1955 deer hunting season a *REAL* success? — Editorial in *Michigan Out-of-Doors*

Why Presidents go fishing

According to former President Herbert Hoover (who should know) fishing is a must for all Presidents because the American people have respect for privacy only on two occasions—when a man is praying or when he's fishing, and the President can't pray all the time.

This doe, carrying two fawns, was killed by dogs on April 25 this year near Bloomingdale, Essex County. Wild dogs? No! An Irish setter and a cocker spaniel were running with the pack that accounted for at least ten deer pulled down this Spring in a square mile area of Essex County near Moose Pond outlet.

Orphaned bear

The girl is Donna Freeman, stenographer of the Conservation Department's Allegany District office, and the little black bear is "Cupcake," one of four cubs temporarily in residence at that office.

Dick Hyde, Game Manager for the Allegany District, says it happened this way: "On March 9 we received a request from a party in the vicinity of Jamestown for a permit to keep bear cubs. Because Department policy is that no such permits be issued, arrangements were made to pick up the cubs, and this in turn touched off an investigation to find out how the cubs were taken in the first place. It was finally determined that on March 3, two men, Robert Gabraith and Howard Foster, discovered a female bear in hibernation. They shot her at close range with a rifle and then discovered she had four cubs.

"The case was handled by Protector John Zentz of Mayville and settled by civil compromise on March 21, with the violators paying $52.50 each.

"The cubs are now being raised by this Bureau and will be kept at the Rushford Conservation Camp during the Summer. In the Fall they will either be kept for study by research personnel or sent to zoos in Buffalo and Rochester."

Black bears normally breed every other year, and two cubs is the rule; quadruplets are very rare. Interesting. But the point is that black bears are protected, it's illegal to pick up their young, we don't need them for research and probably zoos don't need them for exhibition. This is another one of those incidents that should never have happened.

International exchange

The large open water bays on the Canadian shore of the St. Lawrence River have always provided some good canvasback and redhead shooting during the diving duck migration peak. But the hunters on the American south shore of the river for the past decade have looked longingly at these redhead and "Can" flights and settled for scaup and whistlers. During the past season, however, a sizeable number of redheads and "Cans" frequented the bays of the St. Lawrence and the Lake Ontario basin on the American south shore.

Both species, along with scaup, were trapped and banded for the first time at the Conservation Department's Perch River Game Management Area. Next season we hope that we can count on "Cans" and redheads to be with us in greater numbers along the south shore.

Happy ducks

Ducks aren't much different from people—or any other animal—when it comes to food. If there isn't enough around for them to eat they are unhappy. And when they are unhappy they go elsewhere to get happy.

To keep the ducks happy at home, Game Manager Robert G. Ohlman of the Conservation Department's Lower Hudson District set up an experimental "cafeteria" last season at the Quogue Waterfowl Refuge on Long Island. Here's how it worked, according to Ohlman:

"A successful ¾-acre planting of Japanese millet in the 12-acre impoundment on the Quogue Long Island Waterfowl Refuge suggests that this technique may prove to be a valuable aide in producing additional food and cover for waterfowl. Some upland ponds because of their sandy bottoms and acid water characteristics are not producing food of sufficient quantity and quality to attract waterfowl for any length of time.

"The technique used at Quogue was to lower the water level at the end of June so as to expose the planting site. As soon as the area dried out it was harrowed, limed, fertilized and seeded. The lime and fertilizer requirements were determined by soil tests and 500 pounds of hydrated lime and 450 pounds of 8-8-8 fertilizer were applied to the ¾-acre plot on June 28th. Germination occurred within a week. As the millet started to grow the area was shallowly reflooded and the water level gradually raised so that the developing seed head was kept above water until full growth.

"By the last week in August the millet was fully developed and had attracted approximately 100 to 150 ducks. By September 1st the ducks had eaten 80 per cent of the millet crop and by the first of October they had about finished it. Future plans call for planting approximately 8 acres in the impoundment with the view in mind of attracting and holding more waterfowl in the area.

"For Long Island climatic conditions it would seem most desirable to plant millet between the 15th and 20th of July in order that it would mature just prior to the influx of migrant waterfowl. An earlier planting date would be advisable for up-state sites."

Tree farm program

Sponsored nation-wide by state conservation agencies and American Forest Products, Inc., this program represents an organized effort to promote better forestry practices on private lands. To operate the program in New York a special committee has been organized representing Forest Industries, the State College of Agriculture and Forestry, the State Forest Practice Board and the Conservation Department.

On May 3, the Committee held its first meeting at Utica. Plans were laid for dedication ceremonies to be held this Summer near Speculator at which cooperating farmers will be presented with certificates of membership and signs.

E. W. Littlefield, Superintendent of Forest Management for the Conservation Department, points out that further information concerning the program can be secured by writing to Gerald A. Pesez, Chairman, New York Tree Farm Committee, Box 500, Glens Falls.

(Ed. Note: A feature article on the Tree Farm Program is scheduled to appear in an early issue of this magazine.

Letters to The Editor

Eagles & Editors

Sir: In his first letter to the present editor of THE CONSERVATIONIST this writer, who helped edit the original CONSERVATIONIST between 1918 and 1921, offers the following comment on bald eagles in the hope that John F. Risdell, whose letter appeared on page 47 of your April-May, 1956 issue, may find a measure of explanation in these observations.

Without going too deeply into the subject of the range or distribution of the bald eagle, it can be said that this grand bird—the National Emblem of the United States of America, now protected by Federal Law—is by its own choice a resident of eastern North America, east of the Mississippi basin, although it has also occurred in Alaska, British Columbia and other northwest territories containing, or adjacent to, considerable bodies of water. The bald eagle lives mainly on fish.

In the East, the bald eagle nests, or has nested in past years, from Ontario and the Canadian Maritime provinces southward in the coastal regions all the way to the Florida keys. The greatest nesting concentrations have been along the Florida west coast where Charles Broley, a retired Canadian banker, has for many years indulged in the strenuous hobby of banding nestling bald eagles, the total of his bandings to date being something like 1,100 birds. From these bandings and resultant recoveries have come previously unsuspected facts concerning the seasonal habits of bald eagles. Outstanding among these revelations is the discovery that practically the entire eagle population of Florida migrates northward in Summer to spend the hot months in northeastern United States and southeastern Canada.

The Florida eagles return from the North to their nests in the South during the latter part of August and through September, and are to be seen stationed on their nesting trees by early October. Egg laying begins before the end of November and continues through December. Northern eagles may not lay until February or March. A key to the southward movement of Florida eagles in late Summer is seen in the annual reports of the Hawk Mountain Sanctuary Association in Pennsylvania. Maurice Broun, curator in charge at Hawk Mountain, records 80 bald eagles traveling the ridges southward in 1955, all but nine of them in August and September. Many of these were probably Florida birds.

It is in June and early July that I have seen bald eagles on Staten Island, and in at least one instance I saw an eagle passing over my home in Pleasant Plains streaking due North. My guess is that Mr. Risdell has been seeing individual, wing-loose itinerant eagles during his sojourns in Sullivan County. I have seen an eagle at Lake Wallenpaupack, Pa., approximately 25 miles southwest of Risdell's Mongaup River (Swinging Bridge Reservoir) site. It is unlikely that the eagles nest in that area, although not impossible. If Mr. Risdell can locate an occupied nest in Sullivan County he would be making a valuable contribution to the revision of Elon Howard Eaton's *Birds of New York State* now in progress. In their travels northward these wandering eagles are likely to follow up the big river valleys of the Susquehanna, Delaware and Hudson where dead fish, their mainstay food, is to be found. Side flights to lakes of the region are nothing to these masters of the air currents.

The lay reader may have little patience with scientific names of birds, but when deciphered they usually prove highly descriptive and appropriate. Take *Halietus leucocephalus* (Linn.), the book name of the bald eagle. The Greek for white is *leuco* and *cephalus* means head, hence white head—than which no description for the bald eagle could be more fitting.

Howard H. Cleaves, Staten Island, N. Y.

• *Many thanks. We hope to hear from you again.—One Editor to another*

The starving deer

Dear Sirs: I am a 14-year-old Explorer Scout and am very fond of wildlife whatever it may be. I am writing for two reasons. First, I would please like to have all the available information on wildlife projects (feeding, housing, etc.) that your Department can supply us with, because after reading about and seeing the drastic situation of the deer in the Southern Tier this Spring, I feel that there is a lot of work that our Scout Troop can do to help these and other animals.

Secondly, I believe in giving credit where credit is due. The distress call of the deer was heard by sportsmen on a night time TV show. The following morning hundreds of sportsmen went to the aid of the starving deer. Donations of food were distributed to the starving deer. Very clear but very startling articles were written by several reporters, one of which was Tom Cawley.

Thanks for doing a fine job, even though I wish more could be done for these deer. I am awaiting the arrival of your next edition with all 5 senses going full blast.

Thanks a million for your time.

Bob Brutran, Johnson City

• *We referred your letter to Dr. E. L. Cheatum, Chief of our Bureau of Game. Dr. Cheatum is at present preparing an article for publication in our June-July issue (see p. 2) which describes the problem you mention, and he informs me that in writing this article he will consider the points which you have raised.*

Thanks for your interesting and helpful letter. We hope that Dr. Cheatum's article will serve as a satisfactory answer to it.—Editor.

Quail stocking

Gentlemen: In the April-May CONSERVATIONIST you mention quail stocking for New York State. Sixty years ago, when I was a boy of 14, we had quail by the hundreds here in Sullivan County for a period of 3 or 4 years. Then came deep snow in February, and one night a heavy crust—and that was the last I saw of them up 'til now. I hear an occasional bobwhite in the Summer but never have I seen many.

Much more grain was raised in those days than now, especially buckwheat. But it's the deep snow and crust forming that kills them. And I don't see that you can do anything about it.

Louis Boettger, Callicoon

• *Perhaps not, but we can try.—Editor*

That quiz

Dear Editor: The first thing I read in the April-May issue was your editorial, "Now It's Our Turn." Then I turned right to page 8. I think this is one of the best articles yet printed in THE CONSERVATIONIST. I always like to do these quizzes in magazines and newspapers and this one is the best. It was not only fun to do the quiz, but also very informative. I learned quite a number of things in this first quiz and will be looking forward to the next one.

There is one thing I think you should put in the next issue, and that is what you consider to be a passing grade. Some quizzes have 70 as passing and some have 65, depending on the type of quiz. I answered 34 right, or 68 per cent.

Congratulations on this new idea.

George V. Curtis, Clay

• *Congratulations on your score. You did better than most we've heard from.—Editor*

Gentlemen: I was very much interested in the "quiz" in last issue of THE CONSERVATIONIST.

My fifth graders in the Homer Central School (perhaps because I'm their teacher and an ardent lover of nature) wanted to see how many of the 50 questions they could answer correctly. We had no previous discussions of the "quiz," they hadn't seen the questions. I read them and explained the most difficult words.

These boys and girls are 9 and 10 years old (33 of them). We have had many interesting discussions of nature, etc. and I always take the magazine to school.

I thought you'd be interested to know that when I averaged the scores, the average number correct was 38. Don't you think they did well? Many have borrowed the magazine to take home to see "how many Dad knows" (quote).

Mrs. Geo. A. Merrill, Homer

• *Madam, they not only did well, they were sensational, and we're pretty sure Dad is going to come out second best. We're also pretty sure there must be some fine teaching in your classroom.—Editor*

Snowmobile

Dear Editor: In your April-May, 1956 CONSERVATIONIST, Page 7, illustration #3, you show a motorized toboggan. Would you please send me the name and address of a person who can give us information regarding its manufacturer and also to whom I might write to learn how practical this vehicle is for operation in deep snow in remote regions.

I would like to take this opportunity to compliment you on a fine publication.

Henry A. Laramie, Jr.,
Game Management Section Head,
New Hampshire Fish & Game Dept.

• *Our initial contacts when purchasing a motorized toboggan have been with Alexander Brothers, North Creek, Warren County, New York. The machines are made by The 4-Wheel Drive Auto Co., Limited, Kitchener, Ontario, Canada.*

We have three machines. I must admit they cannot be driven through all types of snow. They require a snow base or crust not more than 14 inches deep for a footing. Some Winters we have driven a single machine over 500 miles along trails covered with as much as four feet of snow. When running trap lines for deer or hares, they have saved hours of walking each day because our bigger machine (illustrated in magazine) will cover 20 miles in an hour over a good trail. The small machine covers 10 to 15 miles in an hour.

Alexander Brothers have, in the past, been very willing to demonstrate the machines. —C. W. Severinghaus.

Back copies

Dear Sir: I have a complete set of THE CONSERVATIONIST which I would like to dispose of. Would you be kind enough to mention same in Letters to the Editor in your next issue.

Frederick Clarke, Long Island City

• *We don't want to get into this kind of brokerage business again, but we do keep a file of (1) persons having back copies for sale, and (2) persons wanting to buy back copies. Whenever possible, we put prospective sellers and purchasers in contact—after that, they're on their own. Back copies of more recent issues are available from this Department.—Editor*

Evening grosbeak

Gentlemen: During the Winter, and now, we we have had the evening grosbeaks at our feeding stations in the front yard in flocks of 10 to 50. We have regularly fed the chicadees, the hairy woodpeckers, the downy woodpeckers and an occasional bluejay with sunflower seeds.

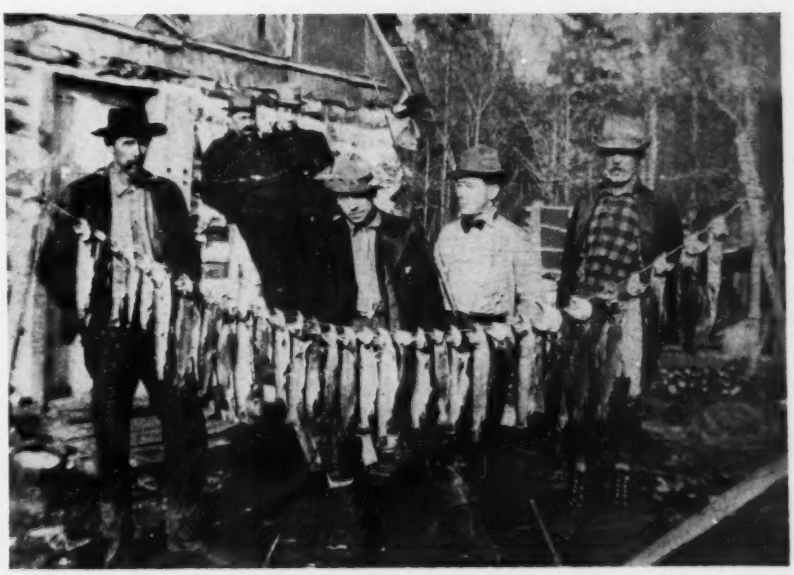
Because the grosbeaks drive the other birds away, we established two feeding stations, but still these birds really get more than their share each day. We resorted to covering the main feeding station until the grosbeaks and their scout (they really have them) get tired and leave. Then we feed the little fellows.

I understand from the newspapers and radio that these birds (usually considered rare visitors in these parts) are visiting in Utica and Forestport. The latest story is that the grosbeaks will do a real job of clearing out tent caterpillars. If this is true, we will keep feeding them for awhile. Can you clear up details of this information?

R. C. Edmunds, Clinton

P.S. I completely and thoroughly enjoy the magazine.

• *We have no definite information as to the role of evening grosbeaks as caterpillar predators. We do know though, that they often do considerable damage to pine plantations, (particularly Scotch pine) by attacking the newly formed buds during late Winter and early Spring.—Editor*



Trout—Then and now

Dear Sir: In the past few years, people who fish in Canada, have forgotten or never knew how good the fishing used to be in New York State.

Am enclosing an old snapshot taken by my father in 1910 at the Wilcox Lake Camp in Lower Hamilton County: 29 brook trout, weighing 47 pounds. Frank Hubbell and William Smith of Northville are supported by the cabin. The two guides in the front, on the ends, are Mike Floyd and his son. The other two men I cannot recognize.

L. H. Chequer, Speculator

• *All is not lost; look at the photograph of the Pepacton brown trout on pg. 37.—Editor*

Moose tree

Dear Editor: I took the February-March issue of THE CONSERVATIONIST along to read on the 'plane when my wife and I flew to the Virgin Islands last month. We were driving between Fredericksted and Christiansted one afternoon when I noticed a "moose tree" beside the road (picture enclosed). It reminded me so much of the picture on page 47 of the above mentioned issue, I thought you'd be interested. The woods are full of 'em.

Dr. Irving M. Falkenbury, Glens Falls

To stock or not to Stock

Dear Sir: At a meeting of the Ontario County Federation of Sportsmen's Clubs, Inc., held March 15, 1956 at which all sixteen of the member clubs were present, it was reported that the Department was being petitioned for stocking of black bass in Canandaigua Lake.

There was considerable discussion, after which it was the consensus of the group that there was already a resident population which was reproducing. The theory of bass stocking, in the presence of an existing breeding population, it was felt, has generally been discredited as a means of making any substantial improvement in fishing. In addition, it was pointed out that there sometimes exists the danger of introduction of disease by additional stocking of bass. It was concluded, in summary, that there had not been any adequate finding of fact that the proposed stocking would have any value, or that it would fit in with the Department's management policy for Canandaigua Lake. As a consequence, it was felt that this might result in a wasteful expenditure of the Department's limited funds and a unanimous resolution was adopted that the Department and its officials be notified that the Federation opposed the stocking.

This resolution is the result of an evolutionary growth of conservation thought here in Ontario County. It is not the intention of the Federation to substitute its judgment for that of the Department's trained technicians. However, we now realize that the sportsmen, in the past, have asked the Department to undertake programs which many years ago were proven to be of little value. We are now beginning to realize that stocking is not so important in fish and game management as we once thought, and when it is carried on at the expense of some more valuable program such as pollution study and abatement, or of habitat improvement, that we actually cause injury to ourselves and our sport by beating the drum for continued or increased stocking.

George A. Reed, Secretary

• *This letter was addressed to Udell B. Stone, our District Fisheries Manager with office in Rochester.*

Sometimes those engaged in Conservation Education find reason to believe their efforts have been fruitful. This letter is surely a case in point. Recognition by members of a county federation—and unanimous recognition—that generally the factors limiting bass fishing do not include scarcity of young bass is a heartening thing. Long experience and much scientific investigation have shown that management methods other than stocking are generally most effective for improvement of fishing for warm-water species. Clearly, employment of stocking, as a method, is most effective when it is possible to concentrate on those phases of the program which really pay off to the angler. —C. W. Greene.

Prosecutor and Judge

Dear Editor: After reading about the La Dolce case in the February-March CONSERVATIONIST and looking at the picture of the 5 deer laying there, I would like to shake Game Protector Madden's hand and say, well done, good and faithful servant.

Also a well deserved round of applause for his honor, Judge Hopkins. Would that there were many more like them.

Floyd C. Hanson, Colton

The Big Tree

Dear Editor: The May issue of *True Magazine* gives a report on the Sequoia sempervirens or redwood and the Sequoiadendron gigantea of the Sierra Nevadas. The latter is also known as the Big Tree. In this report the statement is made that a Big Tree is growing in New York State.

If you can give me any information about this tree—such as size, location, and approximate age—I would be very grateful.

Ernest J. Searle, Baldwinsville

• *I don't know where* True Magazine *obtained its information but it is quite possible that the Giant Sequoia is growing somewhere in New York at this time. The chances are, however, that its days are numbered, since the New York climate is definitely not suited to the growth of this tree. At one time there was a Giant Sequoia growing on the Morgan Estate near the Village of Aurora on the east side of Cayuga Lake in Tompkins County. I saw this tree myself in the early Thirties and estimated it to be a foot or so in trunk diameter and at least 60 feet tall. However, it is my recollection that this tree did not survive the extremely low temperatures which occurred in January and February of 1934. A photograph of this tree appeared on page 23 of the Cornell Rural School Leaflet, Volume 28, No. 3.*

If there are any Giant Sequoias growing in the State at the present time, the most likely places would be the Bayard Cutting Arboretum on Long Island and the Highland Park or Eastman Arboreta in the City of Rochester.—E. W. Littlefield.

Don't let George do it

Dear Sir: I know many people have turtles as pets, but I feel I have an extraordinary one. I found my turtle as an egg in August of 1954 in a sand pit. I took the egg home in a basket filled with sand and kept it in the sun until it hatched. I then named him "George." After reading a few books and studying some pictures, and George, I discovered he was a snapping turtle.

I then put him in a fish bowl, where he has lived for the past few years, since he is still practically the same size as when he hatched. He's much fatter of course. In the Summer I put some sand in the bowl and just enough water so he can be covered completely, yet get out of the water without having to swim. In the Winter I remove the sand and replace it with mud. I then keep it moist and never let it dry.

He has many habits, but his most famous is being nasty. He gets more satisfaction out of that than anything I know of except eating. When George eats hamburg, or anything else for that matter, he holds it in his mouth and tears at it with his claws.

I think if anyone is interested in turtles at all he should get a snapper and raise one if possible. They are very entertaining and interesting.

Gail Samuels, New Hartford

• *But congenitally nasty. Watch out for those jaws, and your fingers.—Editor*

Dear Editor: In almost all the pet stores I have been in, there have been turtles with painted shells. This almost always kills the turtle because the paint keeps the shell from growing and eventually squeezes the turtle to death.

Another thing I have noticed on sale is turtle food containing ant eggs, either with or without other turtle food. Ant eggs give the turtle a soft shell. It also has very poor nutrition.

I am in the sixth grade at Spencerport Central School and I have 12 turtles—8 snappers, 2 false map, 1 yellow bellied, and 1 eastern box tortoise. Herpetology has been my hobby for several years. I have given talks on this subject to several of the classrooms at school and I have always warned the students against these practices.

I want to know what measures can be taken against this menace to the turtle population.

Alan Bachers, Spencerport

• *We understand your concern regarding turtles with painted shells and poor diets. However, since a person is free to scrape off the paint and select more suitable food for his pet, it is more a case of public education than legislation. In this State the land turtles are protected by law. As far as I know, no other legislation is pending regarding these reptiles.*

A new book on amphibians and reptiles (with a good section on keeping various species for pets) is "The Natural History of North American Amphibians and Reptiles," by J. A. Oliver. You might find the book interesting and useful if you find time to look it up.—Wayne Trimm

Volunteer

Gentlemen: Just a brief note to congratulate you on your fine publication. I enjoy each issue immensely.

I would appreciate it if you could help me out concerning a point of personal interest. During the greater portion of the Spring, Summer and Fall seasons I am away from my home on Long Island and I spend a considerable amount of my time camping and hunting in the central portion of New York State.

In search of varmints and seasonal game, I range over an area extending from the northern portion of the Catskill Park on up into the Adirondack Park. Since my hunting vehicle is equipped to be of assistance at small rural fires and carries such gear as shovels, axes, fire brooms and rakes, Indian extinguishers, mobile radio equipment, medical supplies, etc. I would like to know if I could be of voluntary service to the Conservation Department in any capacity. I do cover a fair amount of ground and I am equipped to handle, or be of assistance in, many emergencies. I would be pleased to place myself, my crew (hunting companions), and my vehicle at the emergency disposal of the Department whenever I am in or near State forest territory.

If you, with your knowledge of the workings of the Conservation Department, think that my offer has any merit I will be pleased to contact whatever branch of the Department you might suggest, or I certainly would appreciate your office passing this letter on to the proper persons.

Wm. B. Halsted, Bellport

• *I am enclosing one of our "Roster of Forest Fire Protective Force" (March 1, 1956) in which you will find the names of our District Foresters and the location of their offices. We will be very glad to have you call on any of them any time you happen to be in their vicinity, and will certainly appreciate any assistance you might be able to render.—S. J. Hyde, Supt., Forest Fire Control.*

Too many deer?

Dear Sir: In the March 30th issue of *The Malone Evening Telegram* I read that about 900 deer had been killed on the New York State Thruway. Being a member of rod and gun clubs and also very much interested in conservation, I was wondering if it would be possible to trap some of the deer along the Thruway alive and transport them to areas like the Adirondack Park, or other areas.

We have had a tough Winter up here and I am quite sure a lot of deer have perished. I understand some states transplant deer from one section to another—even from one state to another. If this method would be practical (this is just an idea) it would not only stop some of the slaughter of deer but also save human lives.

As a constant reader of THE CONSERVATIONIST I would certainly like to hear some of our readers' opinions on this matter. I have discussed this with members of the Malone Fish and Game Club, and decided to write to you about it to see if it would be practical. I think THE CONSERVATIONIST is one of the finest magazines on conservation in the country. Keep up the good work.

Jos. A. Garby, Duane

• *We're afraid the solution which you recommend—the live trapping of deer—won't solve the problem. Such trapping is extremely expensive, and so, of course, is the transportation. Furthermore, there appear to be very few areas of the State which now have a shortage of deer; in fact, in most areas a* surplus *is the problem. (Please see page 2 of this issue.) But we do appreciate your taking the trouble to write as you did. —Editor*

Feeding deer

Dear Sirs: It seems to me that the State of New York could dig up enough money from licenses, fines and Wall Street to buy some feed for the deer herds. Throughout this section a deer couldn't reach cedar or spruce boughs in a heavily browsed area if his life depended on it—which it does.

On the back of the Hunting and Fishing license it states "the money you paid for this license goes by law to the Conservation Fund to be used only for fish and game work in this State." This money, and that from fines sometimes amounting to $1,500 for one illegal deer, could help a lot of deer to live that would otherwise starve to death. If I could get some of this feed I would do my best to see that the deer in this immediate locality would get it.

Jim Colligan, Raquette Lake

• *For the past two years the Department has done such feeding, but to get the feed into the areas that really need it is extremely expensive. Hardwood browse cutting, on the other hand, requires only labor, and puts within reach of the animals their natural food. Many sportsmen have co-operated in such cutting—which, incidentally, is permitted in the Forest Preserve.—Editor*

License problem

Dear Editor: I work on quite a large estate here in Ossining on which there is a man-made private lake, and it is privately stocked with fish at the owner's expense. This past Sunday, two young men had obtained permission from the superintendent to fish in this lake, and were so doing when a Game Protector happened by and asked to see their licenses. Not having any, he thereupon gave each of them a summons and confiscated their fishing poles.

My questions are these: Can anyone be fined for fishing in a lake such as this, privately stocked, and by permission of the person in charge? Is the Game Protector within his rights in confiscating the fishing poles?

Arthur R. Bender, Ossining

• *The only exception to the license law is that the owner or lessee of farm lands, actually occupying and cultivating the same, would have the right to hunt, fish and trap upon such lands without a hunting, fishing, or trapping license. Persons under 16 years of age also do not require a fishing license, and members in the active armed services do not require licenses to hunt, fish, or trap in New York State. These exceptions do not apply to the hunting of deer and bear.*

The Game Protector was within his rights in seizing the fishing equipment as evidence, but it would be returned to the owner when the case was disposed of.—A. J. Vormwald

Green grows the lilac shrub

Dear Editor: I've been a subscriber of THE CONSERVATIONIST for a number of years. Little did I dream that I would be writing to you, especially about "lilac." Webster's Dictionary states that it is a shrub bearing a bluish flower and a native of Persia. In my varied readings it has been referred to as a "tree," "bush" and "shrub."

A friend of mine says it is definitely a tree and I say it is positively a shrub.

John Kostyk, Astoria

• *We'll stick with you and Webster.—Editor*

Burls

Sir: This yellow birch tree I found on the head waters of the West Branch of the County Line Creek in the Eastern part of Hamilton County. The tree was about 20 inches in diameter, above this large protuberance on the butt which was eight feet in diameter and about the same in height. The tree was in a dying condition.

Olie DeMun, Wells

• *"Burls" such as the one shown here are fairly common on birch and maple in our north woods and while they obviously represent an abnormal condition, nobody seems to know exactly what causes them. This particular one is certainly a "humdinger" and is about as large as any we have ever seen. It is certainly worth putting on record in* THE CONSERVATIONIST.*—E. W. Littlefield*

Ladies' tobacco

Dear Sirs: Inclosed is a flower slide I took last year. I can't seem to find the name of it in any books that I have. Could you help me out? Or would you refer to me someone that could?

The flower was found at the edge of a woods in a rundown pasture, locally, and around May. It is about 4 inches high. New plants are started by runners.

THE CONSERVATIONIST is tops with me as a magazine. It is a pleasure not to have to thumb through a lot of advertisements.

Charles H. Pulver, Vestal

• *The plant represented is Plantain-leaved Everlasting* (Antennaria plantaginifolia). *Members of the genus to which it belongs are frequently called Pussy's Toes or Ladies' Tobacco. They are quite common in open woods and pastures throughout most of New York State.—Stanley Jay Smith, Associate Curator of Botany*

Natural bait for trout

Dear Sirs: I am a trout fisherman; however, I am not a purist. My normal procedure is to examine the stomach contents of the first fish caught, then select bait or lures. In some cases I use the undigested larvae for bait. Also, I have taken larvae from the stream for fishing without ever selling, transporting or otherwise exploiting them, but my actions have caused many friends to criticize me. Illegal, they yell!

Please answer two questions for me in writing so I can quiet my so-called friends or else change my trout fishing habits:

Question #1. Is it lawful to use for bait larvae caught in the trout stream like caddis, fresh water shrimp and stone creepers, for my personal fishing use on the specific trout stream where caught? (No sale, transportation).

Question #2. If it is lawful to use the above mentioned larvae? May I possess a number of the caddis or creepers while fishing, or may I only have the one on the hook?

E. C. Bartles, Rochester

• *It appears from your letter describing your formula for successful trout fishing that you have been operating in a legal manner. However, as is usual with the Conservation Law, the answer must be qualified. At the present time the law prohibits the taking of hellgramites, dobsons or bass bugs* (Corydalis cornuta) *and perch bugs* (Anax junius) *from waters inhabited by trout or from the banks of such waters. It does not prohibit, though, the taking of other species of aquatic insects from trout waters. Thus the taking from trout waters and use as bait of caddis larvae, stone fly larvae, may fly larvae, etc. is perfectly legal at the present time.*

Further on this score, the Conservation Law was this year amended to prohibit (effective January 1, 1957) the taking of any aquatic insects or their larvae from any waters of the State inhabited by trout. After Jan. 1, 1957, therefore, you could not legally take aquatic insects of any kind or their larvae from trout waters, but there would even then be nothing to prevent your removing such undigested aquatic insects or their larvae from the stomachs of trout legally taken and using such insects or their larvae for bait. In such case you would not be removing the protected insects from the trout stream or banks—but from a trout legally in your possession.

Also there is not now, nor will there be after January 1, 1957, anything to prevent your taking aquatic insects or their larvae from non-trout waters of the State and using them for your personal use as bait in trout waters.—Editor

Cycle of Forest Life

To the Editor: The feature, "Cycle of Forest Life," in your April-May issue is a remarkable piece of work. As art, both the cover picture and story are sensitive and perceptive. The detailed knowledge contained in both present a clear picture of the earth's processes in the full scale so often lacking in similar studies. Painting and words fit like hand to glove. Congratulations to THE CONSERVATIONIST and to Erik Hans Krause and Dr. Babette Brown Coleman for giving us this inspirational and educational piece.

Lewis A. Carter,
Mass. Dept. of Natural Resources

All play and no work

Gentlemen: THE CONSERVATIONIST should be barred from the mails. Every time it comes I want to close up my office and go fishing. Bad for making a living.

Julian Ambrose, D.D.S., Islip

• *But good for patients; at least, every time our D.D.S. cancels an appointment, we feel like going fishing, too.—Editor*

Dogs running deer

Dear Editor: Enclosed is a clipping taken from the *The Reporter Dispatch* of White Plains. Either the North Castle Police or myself is greatly misinformed as to the law concerning dogs running deer. Please set one of us straight.

The Chief states that these dogs, which were tearing the hind quarters of a deer to pieces, could not be shot because the law protects them. If this is so then we need a new law. It is a sad state of affairs when dogs are allowed privileges not shared by humans.

I was under the impression that dogs running deer at any time could be shot. This in my opinion is as it should be. This from one who loves dogs and is a dog owner.

Seely Masker, Pleasantville

• *We quote herewith provisions of the Conservation Law which presently apply to this situation. An attempt to strengthen and extend these provisions was made during the last session of The Legislature, but failed. —Editor*

Sec. 195. Dogs; running at large; training.

1. No owner shall allow his dog to hunt, pursue or kill deer. No owner shall allow his dog to run at large on any enclosed lands on which birds or quadrupeds are possessed under license issued pursuant to any provisions of this article; or any state park; or state park reservation; or state owned game farm; or state owned game refuge; or state owned or leased game management area. Except on lands actually farmed or cultivated by the owner or tenant thereof, no owner shall allow his dog to run at large in fields or woods inhabited by deer outside the limits of any city or village.

It shall be the duty of every game protector, forest ranger and member of the state police to kill, and any person may kill, any dog pursuing or killing deer within the Adirondack and Catskill parks, or pursuing or killing any bird or quadruped on enclosed lands under license issued pursuant to any of the provisions of this article, or state owned game farm, or state owned game refuge, or state owned or leased game management area.

It shall be the duty of every park patrolman, park ranger and member of the state police, county and town police to kill any dog pursuing or killing deer within any state park, county park or state park reservation, at any time. Any game protector, forest ranger and member of the state police may kill any dog pursuing or killing deer anywhere in the state from January fifteenth to April fifteenth. Any member of any town police within the limits of said town, and any member of the Westchester county parkway police on any park, parkway or reservation owned or controlled by the county of Westchester or the Westchester county park commission, may kill any dog pursuing or killing deer from January fifteenth to April fifteenth.

No action for damages shall lie against the person for such killing. "Owner" includes a trainer or other person, possessing, harboring, leasing or using a dog.

Bergall—or cunner?

Dear Sir: Received the February-March edition of THE CONSERVATIONIST today and was confused by the name given to one of the salt water fish in the centerfold. In my home town of New Rochelle we have always called this fish a bergall (or begaul—I have never seen it printed). I am referring to a fish you people call a cunner. Have I always erred in this name, or is there some justification in my name?

George Bartnett, Corbettsville

• *The cunner which appeared among the center spread pictures of Marine Fishes in the February-March* CONSERVATIONIST *is very frequently called Bergall, as you have indicated. A few years ago around the eastern end of Long Island, cunner was probably more widely used as a common name for this species, but in recent years I think that perhaps more people know it as the Bergall. Either name may be used, and Nichols and Breder in their book "The Marine Fishes of New York and Southern New England" state that cunner is the common name all along the New England Coast, while Bergall is used near New York.*

We were, as a matter of fact, stretching things a bit to include this species among our Marine Game Fish. Our only excuse is that great numbers of them are taken by rod and reel fishermen while they are trying to catch something else. Also, they are a good eating fish if you can manage to catch some large enough to keep.—A. W. Bromley

Landowner—sportsmen

Dear Editor: The LaDolce Case, reported in a recent issue, is a fine example of the increasing struggle of the landowner against poaching and illegal hunting. My own problem was growing worse each year until I hit upon a system several seasons ago which has worked out almost perfectly. Perhaps others would care to use it. This is how it operates:

1. I give out a limited number of permissions to hunt on my land. I give each hunter a card to carry which bears my name, the date of the season for which it applies, the hunter's name, and an identifying number. I keep a list.

2. In addition I give each hunter a large card on which is noted the license number, the make and color of his car. This identification must be stuck inside the parked car when it is left on my land.

3. Each man who accepts permission from me must promise me to order off the land any hunter he meets who does not carry similar permission.

When poachers come along, they usually steer clear of the place when they see the identification cards in all the cars along the road. If they do trespass, the first one they meet kicks them off.

I have done very little hunting myself in recent years. So I point out to the boys that they are not patrolling the place for me, but for their own good and to preserve good hunting for the ones who are decent sportsmen. It works.

Of course it is a little trouble to prepare the cards and register the men. But since the system has been in use I have had no unpleasant incidents, we have found no doe or fawn carcasses, and my place is hunted by men who know how to handle guns and are all good sportsmen.

Donald R. Allen, Ancram

Silk and Soda

Dear Editor: I am fifteen years old, a girl, and an avid reader of THE CONSERVATIONIST. I don't usually write letters to the editor of any magazine, but in this case I thought it would be a good idea. I am writing this in the hope you will publish it.

I, unfortunately, live in the city (New York City) most of the year. But we have a house in the country where we reside during the Summer and sometimes on weekends. But what I am trying to say is, I have two horses which I have to sell, and around here no one wants to buy saddle horses.

Soda is a brown and white (paint, or pinto to some) filly. She will be a year old May 1. She is of quarter horse stock, cute and very gentle. Silk is her mother. I guess that makes me a grandmother. Anyway Silk is a black, seven-year-old mare, also of quarter horse stock. However, Silk is very spirited, and is not a children's horse.

I know this is a little out of your line of wonderful work, but once a long time ago horses ran wild in New York State. Where deer and rabbit run today horses ran yesterday. Lowly scrub ponies and firey mustangs. All part of the woods; still today horses are used. Yesterday they were hunted, today they are used for hunting.

So could you please help me find a good home for two good horses. They deserve it. If you do they can get in touch with me at: Elizabeth Trauring, 64-33 99th St., Forest Hills 74, N. Y. C.

Thank you and keep up with the wonderful magazine, and the wonderful work.

Elizabeth Trauring, Forest Hills

• *Yes, it's out of our line, but let's see what happens.—Editor*

Fly dope

Gentlemen: In a recent issue of THE CONSERVATIONIST you reported on the results of a canvass of your experienced woodsmen on "How to get a fire started in the woods in bad weather." I would like to know the results of a similar report on preventing insects' bites (black flies, no-see-ems, etc.).

I'm wondering if there isn't a really good remedy (homemade or otherwise) I have yet to discover. For your information, the best I've come up with is two big work handkerchiefs tied together around my neck, soaked from time to time with one of the standard insect repellent compounds—and a cigar going like mad.

Just in case some wise guy pipes up: I like the woods too well to solve the problem by staying home.

Henry Galpin, Albany

• *Fellow sufferer, there is nothing we can do for you.—Editor*

Fishers Island, alas

Dear Editor: I have enjoyed for several years THF CONSERVATIONIST and believe it one of the finest magazines of its type in the country. However, I have a slight gripe to air. As a former resident of New York State and still an absentee voter, I have looked in vain throughout your issues for any reference to my home and its natural resources. Then, to top off my chagrin, I find on page 29 of the February-March, 1956 issue a map which leaves my home out entirely.

I refer to Fishers Island, which is a part of New York State even if closer to Rhode Island than Long Island. May I suggest that Mr. Alperin, the writer of the story on pages 22-26 on "Down to the Sea—for Fish!" be commissioned to correct his omission by writing a story on the fishing at Fishers Island. He will find the fishing fine.

John F. Shanklin, Washington, D.C.

• *Apparently there's no way we can wriggle out of this one. Mr. Shanklin has got us over the barrel.—Editor*

Freak growth

Dear Editor: Enclosed is a photo of an odd tree formation growing in the town of White Creek, Washington County. You will note that the twin trunks are grown together in four places. Photo taken early in March, 1956.

Philip Colarusso, Troy

North Country logging

Dear Editor: Years ago, on one of my trips back into the then remote region of the Swanson Dam stillwater on the North Branch of the West Canada, I was amazed to discover a large hand-forged anchor hanging in the crotch of a soft maple tree standing on a knoll in back of the Swanson Dam camp of the Adirondack League Club. Further investigation revealed two more anchors lying in the bushes nearby. It seemed reasonable that these anchors must have been connected in some way with the early logging operations, but it was not until just recently that I got the story.

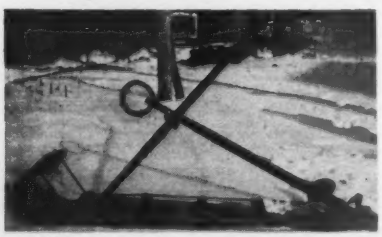
Last Fall, Attorney J. Theodore Cross of Utica was telling me of the desire of the Adirondack Museum at Blue Mountain Lake to obtain mementos of the early logging operations in the North Country, and I told him I would endeavor to get these anchors out of the woods if he would secure the permission of the Adirondack League Club. Through the efforts of Mr. Cross permission was duly received from Mr. Gentry, President of the Club, and just before Christmas, when there was about a foot of snow on the ground and the Winter log road of the Northern Lumber Company was passable by car, Forest Ranger Noel, my brother, Frank, and I drove the 14 miles back into the woods from Route 8 at Nobleboro to a point about a quarter of a mile from where the anchors lay. Transferring our gear (consisting of a couple of axes, two very large wood chisels, a striking hammer, a bar and our lunches) to a toboggan, we hacked a narrow trail through the windfalls.

Two anchors lay on the ground and presented no problem except their dead weight, but the third had been hung by one of its flukes in the crotch of a good-sized soft maple tree for so many years that it had become deeply embedded in the living wood. This was the reason for bringing the hammer and chisels. My brother, being the lightest man, was selected to attack this problem and Noel and I boosted him up to where he could stand on the cross-bar of the anchor and work with an axe and chisels. Eventually the anchor became loose enough to be pried out with the bar and then we hauled them out to the car, one at a trip, on the toboggan.

Mr. Berton Brunner of Poland, now in his 85th year, tells me he worked with these anchors on the Swanson Dam flowground 63 years ago, and that they were used to anchor a capstan mounted on a raft which towed a boom to bring logs down to the foot of the flow where they could be sluiced over the dam and driven about 35 miles down the stream to the sawmill at Hinckley—or Gang Mills, as it was then called. During the Winter the logs, all spruce, were hauled by horses and dumped onto the frozen surface of the flow. Before the ice melted in the Spring a boom, consisting of large timbers chained end-to-end, was placed at the upper end of the flow-ground above the logs and fastened at each end to trees standing on the shore. As soon as the ice had melted and the logs floated freely a capstan, operated by two men and mounted on a raft, would be secured by these anchors at a distance of about 200 feet from one end of the boom and connected to it by a heavy rope. As the rope was wound onto the capstan, that end of the boom would be pulled down the flow the length of the rope and the end of the boom again secured to a tree. Then the anchors would be hauled up, and the raft moved over to the opposite side of the flow. The operation would be repeated again and again in a zig-zag fashion until the slowly advancing boom had brought the logs down near the dam, where the current would carry them over. Then the log drive was on.

I'm also enclosing a couple of other photos which may be of interest. The picture of the Linn tractor hauling 12 sleighloads of pulpwood logs was taken in 1917, and the horsedrawn load of pine logs at Brandreth Lake about 1914.

Ernest W. Blue, Forest Ranger (retired)
Poland, N. Y.



Posting problem

Dear Sir: A brook traverses the property of a private landowner and passes under a bridge on a public highway. The land is posted.

Does a fisherman (licensed) have a right to fish the brook from the bridge abutments? Can he enter the stream at the bridge and walk the stream for any distance providing he does not touch foot on owner's property?

These two questions came up recently at a small gathering where only one fisherman (guess who) was present. The legal minds argued right of domain, etc., etc. If you can answer these two questions it would help my standing as a fisherman and a great admirer of your wonderful magazine.

John M. Dooley, New York

• *According to a permanent injunction ordered by Judge Dievendorf in 1926, it is illegal to fish off a bridge into private waters. It is also illegal to wade up a stream which is posted on both sides, or which is included within the bounds of private posted property. For your information, we enclose a reprint from an article entitled "The Posting Law."—Editor*

An idea

Dear Sir: As a hunter and subscriber to a swell publication I would like to offer a suggestion:

Have a metal sign posted on State lands, and within the park areas, giving telephone number, person or company to call if there should be a fire. This could be a plate the same size we have on our cars. Just a thought, but if you like please pass it on.

Byron W. Holmes, Secretary,
Unadilla Forks Volunteer Fire Co., Inc.

More on European woodcock

Dear Sir: In reference to a letter signed by W. N. Macartney, of Utica, on page 45 of your February-March, 1956 issue. May I refer the writer to the January 16, 1956 issue of *Sports Illustrated* (published by Time, Inc.) in which the story is told on page 54 of the discovery of a European woodcock during the Christmas Bird Count (1955-56) at Cape May, N. J.

I believe that the bird was not "taken," merely observed by an expert.

Eugene T. Mudge, Northport, L. I.

Bibliography

Dear Editor: I was pleased to see my book, "Illustrated Guide to Trees and Shrubs," in the analysis of books on trees and shrubs in the current number (April-May) of THE CONSERVATIONIST.

The present edition of my book is now nearly exhausted and Harper & Brothers are publishing a new, revised edition. The following note contains this information which I should appreciate having you include in your next number.

"Illustrated Guide to Trees and Shrubs," by Arthur Harmount Graves, Ph.D., has been chosen by Harper & Brothers as one of their 'Nature and Outdoor Series.' The first edition was published by the author in 1952. The new, revised edition will include the 'Winter Key' which was published separately in 1955. Publication date of the new edition is given as June 20, 1956."

Arthur H. Graves, Wallingford, Conn.

Tragedy on Nippletop

Dear Editor: We express our appreciation to Ranger John Hickey of Keene, and to Caretaker Paul Lewis of the Ausable Club for their efforts in the attempted rescue of our companion, Douglas Funsett, who tragically met death on Nippletop Mountain on January 28. It was a great comfort to us to obtain such capable help in this emergency.

We hope you will print the above acknowledgment in THE CONSERVATIONIST in your Letters to the Editor. These men were very helpful to us, and we feel that this is least we can do to repay them.

John F. Siau, Robert Wiley, Schenectady

Starlings and English sparrows

Dear Editor: In the matter of the English sparrow (Feb.-Mar., 1956) which was introduced into this country (as was also the equally obnoxious European starling) before the Lacey Act of 1900 prohibited the introduction of foreign birds without permission from the Fish and Wildlife Service:

Farmers' Bulletins show that the English sparrow destroys far more beneficial insects than injurious ones, and farmers estimate that a flock of 150 sparrows costs them not less than $50 a year in grain. The sparrows, which were introduced into Brooklyn, have spread to the Pacific Coast. Following their introduction, song birds, which had bred in the cities, began to disappear. When it was found that the sparrows destroy the eggs or peck out the eyes of the fledglings of blue birds, wrens, swallows, fox sparrows and other valuable native sparrows, and usurp their nests, public indignation mounted and bounties were offered for the birds. Attempts were made also to induce the public to eat them, in the hope that they might thus be exterminated, and one Albany market sold 1,700 in a single week at a dollar a hundred.

The starling drives the song birds from their nests, eats their eggs or drops them on the ground, annihilates the fledglings and tears the nests apart, and it is estimated that a pair of starlings will depopulate a large orchard of its song birds in a short time. Both English sparrows and starlings damage fruit and young vegetables, as well as wheat and other grains.

During several recent years a sparrow trap was exhibited at the New York Flower Shows (not this year, and there was no Show last year) and it was reported in some of the agricultural magazines that the farmers, after releasing any native birds taken in the traps, wrung the necks of the English sparrows and laid out as many as 25 every evening for the consumption of their own and their neighbors' cats.

Of course they can be shot also, as you suggested in your answer to Mr. Strosnider in your April-May issue. The mother cat of my childhood fared exceedingly well, as one of my brothers brought down an English sparrow from our backyard cherry tree for her every morning with his Flobert rifle—a budget saving for us and high living for the cat at a time when sparrows were worth something as bounty.

I do not know whether the man who made the sparrow traps is still in business, but his name and address were Roy Vail, La Grange, Indiana.

The New York statute providing that it shall be "considered a misdemeanor to intentionally give food or shelter to the English sparrow" has never been rescinded to my knowledge, yet many people in the cities feed the sparrows with bread, ignorant that they are not only breaking a law but damaging the chances of our song birds' survival.

Ida M. Mellen, Brooklyn

Jiggers, or chiggers

Dear Editor: Maybe the scribe who is supposed to be working up a story on jiggers (your Dec.-Jan. issue, pg. 47) will know how-come there are no jiggers in the western arm of New York State. I grew up on the lakes, hills, farms of Schuyler and Yates counties and have summered there for 60 years and never even knew what a jigger was until a war party of them established a beachead on my shins in Mississippi, and I was so innocent that I scratched for days without knowing what was biting me.

No blackflies, no bite-em-no-see-ums in western New York either. Are we stump jumpers and ridge runners pizen to them? Cold winters can't be the answer, since they are in much colder climates north of that section.

Albert G. Ingalls, Cranford, N. J.

• *We don't know the answer, but we do know you're lucky.—Editor*

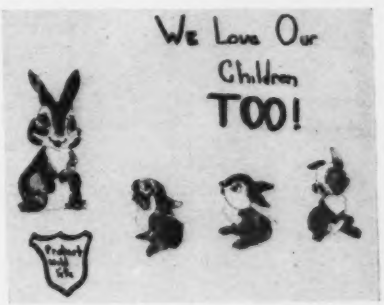
The legality of posting

Sir: In your February-March issue I noted, as I have previously, many references to the posting law. You remark, in reply to a letter on the subject: "Enforcement of the posting law is particularly difficult, since the law and its enforcement involve some of the basic principles on which the society of this country is founded."

In this connection I should like to call your attention to the State of Pennsylvania, in which (if I am not mistaken) posting is illegal, and to the Constitution of the State of New York (Article 1, Section 10), which states clearly that "the people of the state, in their right of sovereignty, possess the original and ultimate property in and to all lands within the jurisdiction of the state."

Fred Crane, Bedford

• *As to the legality of posting, you quote from Article 1, Section 10 of our State Constitution. But there is also in that same article and section a phrase which you did not quote: "All lands shall forever remain allodial so that the entire and absolute property is invested in the owners, according to the nature of their respective estates."*
—Editor



Death on the highway

Dear Sir: During trips to my farm in Delaware County last Summer, my family, especially my 16-year-old daughter, was distressed at seeing the large amount of wildlife which is killed on the highways. We got to comparing the little "Drive Safely—Save Game" signs with the much more imaginative signs used to reduce the hazard to children near schools, and wondered if a similar technique might be more effective in protecting wildlife.

My daughter as attempted to illustrate this idea with the sketch enclosed.

William C. Tinus, Maplewood

Credits

First cover, Winslow Homer; second cover, page 4, N. Y. S. C. D.; 2, 3, Bell Aircraft, R. W. Darrow; 6, 7, Doug Payne, Cornell; 10, 12, 22, 31, Roy Irving; 13, 14, 15, 16, 17, 20, 21, 23, 24, 25, 26, H. Wayne Trimm; 18, 19, U. S. Dept. Agr., Irving; 27, U. S. Fish Station, Cortland; 28, 29, Madame Bernier-Boulanger; 30, Ed. Sullivan; 32, Theodore Langie, D. O. Showers; 34, A. A. Allen, Irving; 35, Trimm, Milt. Hick; 36, Trimm, Al. Tucker; 37, Herbert Buckley; 38, Earl McGuirk, Bill McLaughlin, Adirondack Enterprise; 39, Dick Hyde; 3d cover, Clayt Seagears; 4th cover, N. Y. S. Museum.

Bootstraps Farm

No. 4—Well, the Birds Like it

IT WILL be three years next Nov. 15 since I acquired Bootstraps Farm and moved into its little heatless house with Blondie, a barreltype English bulldog with a terrible snore.

Bootstraps spans a high, wild, hill in Rensselaer County. The road, understandably, lies down and quits in the front yard after a steep, twisting climb that I invariably approached that first hard Winter with chains and apprehension. Now it's a breeze. I wear a feather in my hat and have learned to yodel.

The forest constantly showers seed upon Bootstraps' thin, scattered fields from which a long succession of farmers tried in vain to blast a living. The last one gave up plowing, next kissed the hayfields goodbye, tied his one cow to a stake (because the fences were gone) and took up chickens. Apparently, they took him. But the big metal hovers are still in use. Cut in half, I find they make fine window awnings.

Bootstraps is representative of New York's 5,000,000 acres of abandoned farms—one-sixth of the state. What to do to restore at least some kind of productivity to this enormous area of waste has for years been one of our most perplexing conservation problems. (CONSERVATIONIST, Oct.-Nov. '47.)

Today, increasing thousands of people —mostly city people—are acquiring these old properties. They fix up the house and the door yard and establish trade with local merchants. Thus the place restores some degree of economy to the community—and the ripple spreads to larger schools, better roads, higher local living standards. But the rest of the property, perhaps hundreds of acres, just sits there and twiddles its brushy fingers. It doesn't bear its load.

One of the main reasons for acquiring Bootstraps was to find out what one unskilled person could do to boost the values of a whole ramshackle layout—both buildings and land—with a minimum expenditure and very little working time available.

First I put in a two-acre pond 100 feet from the house (CONSERVATIONIST, June-July '54). For my money it's a dandy. It sets off the whole joint. It cost me $296 to build (37 bulldozer hours) plus $27 worth of sand for a bathing beach and 50¢ worth of nails to make a dock out of an old pig sty I tore down. No pigs.

Opposite is the picture story of some of the values in this pond. First is the "gazing" chair in the coming shade of a big catalpa (not yet in leaf June 5). On the beach is pulled the canoe. Off the dock is water deep enough for diving and trout. The foreground island was put there for four reasons: it was a handy way to dispose of surplus dirt scooped out to make a good swimming area; it might tempt wandering muskrats to burrow there instead of in the dam; it might serve as a nest site for black ducks and, finally, I thought it would be picturesque.

It already is honeycombed with muskrat burrows and the dam is intact. Ducks haven't used it yet although one is now incubating eleven eggs on another islet—the one that looks like a beaver house near the drawing's center. That's the black duck drake standing guard with his neck stretched up a mile. He often sits there motionless—the tip-off that his mate was nesting nearby. Otherwise I never would have discovered the nest hidden under the brush I piled there last Winter.

Two wood duck drakes are in the foreground. Their mates are brooding big clutches of eggs in nest boxes. One box is on the reflected tree at the right. The other is hidden behind the birches. The ice didn't go out of the pond until April 16 this year. Next day, both boxes had customers. Last year, one brood was turned out.

The little birds flying over the water are tree swallows—mosquito catchers de luxe. On may 10, a bunch of about 50 arrived on the pond. Last year they stayed only a week. No nests. This time I nailed a couple of wren houses back to back on a pole and carried it to the dock to erect. These birds proved so crazy for nest sites that one actually entered a box before I got the pole off my shoulders. Within an hour nest material was being carried into both boxes. Nine other kinds of birds nest around the pond.

Dotting the point of land at the right are some of the thousands of white spruce planted, along with red pine, in several of Bootstraps' old fields during late April '54. The conifers from the Conservation Department's forest tree nursery at Saratoga, were free because I had signed up as one of New York's Forest Practice Act cooperators. The planning sites, the proper species to plant and the crew of high school boys who did the job (cost $42) had all been arranged for by cooperative effort between one of the Department's foresters (who mapped out a plan of productive forest management for Bootstraps) and the local Soil Conservation District.

A year ago I planted 3,000 of the tricky Douglas fir and balsam on some selected sites but as far as I can determine I lost nearly all of them last Winter. Cottontail rabbits ate them right down to the ground. But they didn't touch the spruce, pine or larch although deer pruned a few. Rabbit damage here last Winter was heavier than I have ever seen. They weren't cropped enough last Fall. But this year I'll be heating up hearty helpings of hassenpfeffer, you betcha.

This Spring's planting has been concentrated on prettying up the pond reflections and the lawn's edges with flowering crabs, azaleas, laurel, rhododendrons, dogwood, high bush cranberries, dwarf apples and other stuff—all fortified with heaps of duff from under the oaks or barrow-loads of ancient peat-like material from a vibrant pyramid conveniently piled years ago by the old cow barn (which, by the way, now sports a wood floor and a 16-foot, two-ton antique bar from an old inn—just for fun).

I forgot to mention that little speck jutting from the tree on the highest point of the hill beyond the pond. It's a white cloth bag put there this Spring by a crew from the Department's Bureau of Forest Pest Control. They found a bad infestation of gypsy moth during routine checks of the region. The bag guided the path of the Department's spray plane which did a job on the pests one recent windless dawn. Otherwise they undoubtedly would have caused serious damage to a mile-long chunk of hardwood forest and then spread out from there.

A thousand jobs on the general resuscitation program for Bootstraps are not yet even started. The back of the barn (which I see little of) still lacks paint. But some week-end I'll fix the spray gun and get started again. And with the big ladder in place maybe I'll find time to patch the roof. Or maybe the day will be too nice and I'll start pruning a piece of that potentially big Christmas tree crop. Or maybe I'll just go swimming. A few years ago I'd have had to travel a long way for that pleasure.

—Clayt Seagears

(SUPPLEMENT TO THE NEW YORK STATE CONSERVATIONIST, JUNE-JULY, 1956)

INDEX TO

THE NEW YORK STATE

Conservationist

Volumes Nine Through Ten

From August-September, '54 to June-July, '56

KEY TO ISSUES

AS—August-September
ON—October-November
DJ—December-January
FM—February-March
AM—April-May
JJ—June-July

(Compiled by Roland B. Miller)

The index for Volumes 1 through 6 was a supplement to the June-July, 1952 issue; the index for Volumes 7 through 8, was a supplement to the June-July, 1954 issue.—R. B. M.

AIRPLANE WORK

Trout from Heaven	P. W. Fosburgh	FM 55

AMPHIBIANS

Frogs and Toads of New York	Dr. Albert H. Wright	AS 55

ARCHERY

Field Archery in New York	A. W. Bromley, Paul Kelsey	ON 55

ART

(See also classifications listing in color)

"A Good Shot—Adirondacks" (Deer Hunting—Then and Now)	Winslow Homer	AS 55
"Anticipation" (mountain lion)	Clayt Seagears	DJ 55–56
Apples for Grouse	Geneva Experiment Station	ON 55
Belted Kingfisher	John James Audubon	AM 56
Birdhouses and Feeding Stations	H. Wayne Trimm	AM 56
Blister Rust	College of Forestry, Geneva Experiment Station	DJ 55–56
Buck Deer	H. Wayne Trimm	FM 56
"Burnt Mountain" (Deer Hunting—Then and Now)	Winslow Homer	AS 55
Camp 3 (On Closing Camp for the Winter)	Clayt Seagears	ON 55
Frogs and Toads of New York	H. Wayne Trimm	AS 55
Game Habitat in New York	Nick Drahos	ON 55
"Hauling in the Gill Nets"	Frederic Remington	FM 55
Haying	P. W. Fosburgh	JJ 55
"Hound and Hunter"	Winslow Homer	AS 55
Montezuma Marsh	H. Wayne Trimm	JJ 56
New York Furbearers	H. Wayne Trimm	DJ 54–55
New York's Sporting Spots (The Oswegatchie River Near High Falls)	Clayt Seagears	AS 55
Notes on the Catskill Hare	H. Wayne Trimm	DJ 55–56
Prehistoric Mammals of New York	H. Wayne Trimm	FM 55
Red Fox	Clayt Seagears	FM 55
Smelting Off Taughannock Creek (Dipping for Smelt)	Elmer Phillips	AM 56
Snakes of New York and Their Ranges	H. Wayne Trimm	JJ 55
Some Prehistoric Indian Artifacts of New York	H. Wayne Trimm	DJ 55–56
Spring Work on the Farm	Winslow Homer	AM 56
Still Life	George Cope	ON 55
Sugaring Off	Eastman Johnson	FM 55
Summertime, Adirondacks	P. W. Fosburgh	JJ 55
Surf Fishing at Montauk Point—Hooking a Striped Bass	Hy S. Watson	FM 56
The Big Buck and the Little Buck	Clayt Seagears	DJ 54–55
The Care of Raw Furs	Nick Drahos	FM 55
The Coyote and the Hare	H. Wayne Trimm	DJ 55–56
The Cycle of Forest Life	Erik Hans Krause	AM 56
"The Hudson at Dobbs Ferry" (The Hudson River Suite)	Kensett	AS 55
"These Fairy Mountains"	N. C. Wyeth	AS 54
"The Rise"	Winslow Homer	JJ 56
The Sugar Maple	H. Wayne Trimm	AM 56
The White-tailed Deer in New York City	Museum of Natural History, New York City	AS 54
Trolling for Bluefish—Fire Island Inlet	Hy. S. Watson	FM 56
Trout Fishing on Chateaugay Lake	A. F. Tait	FM 55
Winter Scene	Mel Hunter	DJ 54–55
Winter Snapshots	Mrs. Irene M. Heffner	DJ 54–55
Woods Scene; Summertime, Adirondacks	P. W. Fosburgh	JJ 55

ARTIFICIAL LURES (In Color)

Deer Hair Nymph, Quill Gordon, Dark Hendrickson, Coffin Fly, Royal Coachman		AM 56

BIRDS

About Birds	Clayt Segears	ON 55
Cedar Waxwings		AS 55
Conservation—for the Birds	H. Wayne Trimm	AM 56
High Hawks, Low Hawks	H. Wayne Trimm	AS 54
Nest of a Northern Flicker	Dr. Albert R. Shadle	AS 55
Spring Drummer	Clayt Seagears	AM 55
The Wood Duck—Nominee	Clayt Seagears	JJ 55
Two of Our Exotics—The House Sparrow and the Starling	Dirck Benson	FM 56
Our Warblers	H. Wayne Trimm	AM 55
Shorebirds of New York	Dr. Kenneth C. Parkes	ON 55

BIRD PLATES (In Color)

Bobwhites—on the Rise?	Louis Agassiz Fuertes	AM 56
Bohemian Waxwing, Cedar Waxwing	Louis Agassiz Fuertes	AS 55
Bright as Autumn (Green-winged Teal)	Clayt Seagears	ON 55
Duck Banding in New York	H. Wayne Trimm	FM 56
Duck Heads	Nick Drahos, George Schultz, David G. Allen	ON 54
Ducks in Color	A. F. Tait	ON 54
Hawks and Eagles of New York, Part I	H. Wayne Trimm	AS 54
Hawks and Eagles of New York, Part II	H. Wayne Trimm	ON 54
"How are Things Getting on in There?" (Male wood duck)	Clayt Seagears	JJ 55
Ruffed Grouse	Clayt Seagears	AM 55
Small Game Hunting Prospects	H. Wayne Trimm	ON 55
Shorebirds of New York	H. Wayne Trimm	ON 55
Turkey	Louis Agassiz Fuertes	DJ 55–56
Two of Our Exotics—The House Sparrow and the Starling	H. Wayne Trimm, Louis Agassiz Fuertes	FM 56
Warblers	H. Wayne Trimm	AM 55

BLOW-DOWN

(Of Nov. 25, 1950)

Cold River Area Opened		FM 55
Salvage Report	Wm. M. Foss	AS 54
Salvage Report	Wm. M. Foss	AM 55

CAMPSITES

Campsite Data		JJ 55
Public Campsite Expansion		JJ 56
Public Campsites Open May 26	Wm. D. Mulholland	AM 55

CANOEING

New York's Sporting Spots—The Oswegatchie	Clayt Seagears	AS 55

CONSERVATION (General)

Advisory Committee on Conservation		DJ 55–56
Air Age Conservation	Gustav A. Swanson	DJ 55–56
Conservation Where Needed	A. W. Bromley	JJ 55
Dear Subscriber:	(editorial)	AM 55
Dial "C" for Conservation		FM 55
It Can Happen There, Too		DJ 54–55
Litter and the Conservationist	John Guenther	DJ 54–55
Seabee Operation Lean-to	W. Waterman	AM 56
To Our Subscribers	(editorial)	DJ 54–55

CONSERVATION DEPARTMENT

All's Well That Ends Well	H. S. Canfield	DJ 54–55
Cited by Red Cross		DJ 54–55
Flash Flood	(editorial)	JJ 55
For More Public Lands	Louis A. Wehle	FM 56
For the Forest Preserve	Wheeler Milmoe	FM 56
The Department's Program (To Harden Pheasants To Harden Trout)		JJ 55
The 5 Per Cent	(editorial)	ON 55
The Good Old Days	(editorial)	AS 55
The Morning Mail	(editorial)	FM 56

CONSERVATION DEPARTMENT JOBS

Game Protector Exam.		DJ 54–55

CONSERVATION EDUCATION

A Merry Christmas To All	(editorial)	DJ 55–56
Conservation at Roe-Jan	James Stevens	AS 54
Conservation Good Turn	Ted S. Pettit	AS 55
Conservation Library		FM 56
Conservation Library. Part 2		AM 56
Conservation Library No. 3		JJ 56

Cornell's New Campus	Gustave A. Swanson	AM 56
Gentlemen's Agreement	(editorial)	ON 54
Good Turn for '54	Ted S. Pettit	AS 54
Junior Hunters in Michigan		FM 55
Longshore Treasure	Dr. Henry M. Stebbins	AM 56
Now It's Our Turn	(editorial)	AM 56
Onondaga County Conservation Week	Dr. Benjamin A. Sauer	FM 56
Our Camp Program	Nick Drahos	AM 55
Sportsmen's Conservation Workshop	Lawrence S. Hamilton	AM 55
The Arnot Conservation Leadership Training Camp	D. B. Fales	DJ 55–56
The Cycle of Forest Life	Dr. Babette Coleman Brown	AM 56
We Train New Hunters	Dr. Henry M. Stebbins.	FM 55

COUNTIES (With Maps)

Broome County	H. Wayne Trimm	DJ 54–55
Cayuga County	Roy Irving	FM 56
Chautauqua County	Roy Irving	AS 55
Chemung County	Roy Irving	JJ 55
County Maps		ON 54
Madison County	H. Wayne Trimm	ON 54
Oneida County	H. Wayne Trimm	AS 54
Onondaga County	H. Wayne Trimm	FM 55
Schuyler County	Roy Irving	DJ 55–56
Seneca County	Roy Irving	AM 56
Tioga County	Roy Irving	AM 55
Tompkins County	Roy Irving	ON 55
Wayne County	Roy Irving	JJ 56

CRAFTS

How to Start a Fire		DJ 54–55
Indian Leather	H. Wayne Trimm	ON 55

FICTION

The Legend of the Dogwood Tree.	Rosemary Clarke	AM 56

FISH

Chubs	John R. Greeley	AS 55
Lake Trout	C. W. Greene	AM 55
Ocean Currents, Pollution — and Fish	John C. Ayres	FM 55
Our Black Basses	John R. Greeley	JJ 55
Peconic Bay Visitor	Irwin M. Alperin	JJ 55
Shiners	John R. Greeley	DJ 54–55
Striped Bass		AM 56
Sunfishes are Bright	John R. Greeley	AS 54
White Bass	John R. Greeley	AS 55
White Perch	Frank A. Toman	AS 55

FISH CULTURE

Bath Hatchery	W. Mason Lawrence, James J. Lindsey	FM 56
Bath Hatchery Fire	(letters)	AM 56
The Color of Trout	D. R. Brockway, D. C. Haskell	JJ 56
Fish are Worth Their Salt	Clayt Seagears	FM 56
The Cortland Hatchery	John R. Greeley, Arthur M. Phillips, Jr.	JJ 56

FISHERIES (Commercial)

Raising Crayfish for Bait	John L. Forney	JJ 56
This Bait Fish Business Regulations	John L. Forney, W. Mason Lawrence	DJ 54–55
The Great Lakes Fisheries	W. Mason Lawrence	DJ 54–55
The Haul Seiners	Warren J. Rathjen	AM 55

FISHING

And Speaking of Salmon	John R. Greeley	JJ 56
Angler for Red Salmon	John R. Greeley	JJ 55
Cayuga—a Lake Trout Laboratory	Dwight A. Webster	AM 55
Dipping for Smelt	A. C. Petty	AM 56
Down to the Sea—for Fsh	Irwin M. Alperin	FM 56
Lake Ontario Lake Trout	Donald G. Pasko	FM 56
Marine Game Fish of New York	A. W. Bromley	FM 56
Oneida Lake	A. C. Petty	DJ 55–56
Record Brown Trout		AS 54
Spear Fishing	W. Mason Lawrence	AS 55
The Governors Go Fishing		AS 54
Trout Fishing on Chateaugay Lake		FM 55

FISH MANAGEMENT

Champlain Ice Fishing Census	Robert G. Zilliox	DJ 54–55
Chenango Carp Drive	A. C. Petty	DJ 55–56
Experimental Carp Control	Howard A. Loeb	AS 54
Fish Ponds in New Zealand	Roy Irving	ON 55
Landlocking Atlantic Salmon	John R. Greeley	JJ 56
30 Tons of Muskalonge		DJ 54–55

FISH PLATES (In Color)

A New Deal for Pitchfork Pond.	H. Wayne Trimm	DJ 55–56
Blue-gill Sunfish	Ellen Edmonson	AS 54
Cayuga—a Lake Trout Laboratory	Ellen Edmonson	AM 55
Common Sunfish	Ellen Edmonson	AS 54
Curious Characters for the Salt Water Tank	Clayt Seagears	FM 56
Hornyhead, Fallfish, Horned Dace (Chubs)	Hugh P. Crisp, Ellen Edmonson	AS 55
Lake Ontario Lake Trout	H. Wayne Trimm	FM 56
Landlocking Atlantic Salmon		JJ 56
Log Perch	Ellen Edmonson	DJ 55–56
Long-eared Sunfish, Spotted Sunfish	Hugh P. Crisp	AS 54
Marine Game Fish	H. Wayne Trimm	FM 56
Red-bellied Sunfish	Ellen Edmonson	AS 54
Red-Fin Shiner, Hankinson's Minnow	Ellen Edmonson	DJ 54–55
Our Black Basses	Ellen Edmonson	JJ 55
Smelt (Dipping for Smelt)	Ellen Edmonson	AM 56
Spot-Tailed Minnow, Emerald Minnow, Satin-Fin Minnow	Ellen Edmonson	DJ 54–55
Straw-Colored Minnow, Fathead Minnow, Golden Shiner	Ellen Edmonson	DJ 54–55
The Color of Trout (Brown Trout)		JJ 56
White Bass	Hugh P. Crisp	AS 55
White Perch	Hugh P. Crisp	AS 55

FISH RESEARCH

A New Fisheries Survey	C. W. Greene	AS 54
Great Lakes Fisheries		DJ 55–56
Internal Tagging of Weakfish	John C. Poole	JJ 55
Marked Fish Returns from Marking; Marked Fish in New York; Methods of Tagging Fish	Dwight A. Webster, C. W. Greene	JJ 55
Movements of Trout and Salmon.	John R. Greeley	AM 56
Striped Bass Study	W. Mason Lawrence	AS 54
Sunfishes are Bright (Common, Red-bellied, Blue-gill)	John R. Greeley	AS 54
Weakfish Study	Alfred Perlmutter	FM 55

FLOODS AND FLOOD CONTROL

Diane in the Catskills	Cecil E. Heacox	ON 55
Diane and the Shinglekill		ON 55
Flash Flood	(editorial)	JJ 55
Program for Small Watersheds (2)	Oliver Hyatt	AS 54
Small Watersheds (3)	George R. Metcalf, E. W. Littlefield	ON 54
Taming the Crooked River	David G. Unger	JJ 55

FLOWERS AND OTHER PLANTS

June in January	Robert A. Leslie	AM 55
No Ambrosia for Sullivan County	Roland B. Miller	ON 54
Some Plants to Leave Alone	Ralph H. Smith	JJ 55
The Hart's Tongue Fern	Dr. Mildred E. Faust	AM 55
Weed Control Conference	Roy Irving	FM 55

FLOWER PLATES (In Color)

Freak Trillium		JJ 56
Low or Pasture Rose	Homer D. House	JJ 55
Pitcher Plant; Sidesaddle Flower	Homer D. House	JJ 56
Some Plants to Leave Alone (Blue Flag, Showy Lady's Slipper)	Homer D. House	JJ 55
Rhododendron, Swamp Berry	Edmund Emshwiller	DJ 55–56
The Hart's Tongue Fern	Dr. Mildred E. Faust	AM 55

FOREST FIRE CONTROL

Fire Control in Miniature	Robert M. Roche	DJ 54–55
Fire Control—Then and Now	Solon Hyde	ON 54
Fire Prevention in Quebec		AS 54
Forest Fire Danger Meter	Abe George	ON 55

FOREST FIRES

February Fire	.....	AM 56
Long Pond Mountain Fire	Solon Hyde, Fred E. Fohrman	ON 55

FOREST MANAGEMENT

A Package Deal for Woodlands	Barker W. Hopkins	DJ 55–56
Forest Conservation in Britain	Sir Wm. Ling Taylor	ON 55
Forestry in Norway	E. W. Littlefield	AS 55
Rebuilding Land and Men (2)	Wm. M. Foss	ON 55
The Forest and the Game	Albert G. Hall, F. F. Weight	AS 55
To Kill With Chemicals	David B. Cook	JJ 55
Trees by the Pound	.....	AM 55

FOREST PEST CONTROL

Attack on the Saddled Prominent	Nick Drahos	ON 55
Blackout for Blackflies	Dr. Donald L. Collins	JJ 55
Blister Rust	Fred U. Sievers	DJ 55–56
Eastern Tent Caterpillar	Roland B. Miller	JJ 55
Forest Pest Control Meeting	.....	FM 55
Forest Tent Caterpillar Defoliation	.....	ON 54
More on the Saddled Prominent	Nick Drahos	ON 55
Paradise at Paradox	D. L. Collins, C. J. Yops	JJ 56
Pest Control		ON 54
Present Status of Gypsy Moth in New York	Bill Masterson, Dave Mitchell	AM 55
The College Elms	Jerome G. Kovalcik	AM 55
The Gypsy Moth	W. E. Masterson, David Mitchell	JJ 56
Those Big Flies	.....	AS 54
You Want the Wobble?	.....	AS 54

FOREST PRESERVE

Answers to the Forest Preserve Quiz	.....	AM 56
Detached Areas of the Forest Preserve	.....	AS 54
For More Public Lands	Louis A. Wehle	FM 56
For the Forest Preserve	Wheeler Milmoe	FM 56
Now It's Our Turn	(editorial)	AM 56
Salvage Report	Wm. M. Foss	AS 54
Salvage Report	Wm. M. Foss	AM 55
The Forest Preserve (Letters)	.....	ON 54
Quiz on the Forest Preserve	.....	AM 56

FOREST PRODUCTS

Close Enough	.....	AS 54
How Strong is a Tree Cone?	E. J. Eliason	AM 55
Maple Products Note		AM 56
Pulpwood for the West Virginia	David B. Cook	ON 55
Report on Wood Chippers	Prof. E. W. Foss	AS 55
Sugaring Off	Nick Drahos	FM 55
Sugar Maple Grows Big in Onondaga County	.....	AS 54
The Christmas Tree Business in New York	Leslie R. Stutzman	DJ 54–55
Veneer	David B. Cook	AS 54

FORESTRY

Forest Conservation in Britain	Sir Wm. Ling Taylor	ON 55
Forestry in Norway	E. W. Littlefield	AS 55
More About State Forests	Charles F. Baar	AM 55
Reforestation in Norway	.....	JJ 56

FURBEARERS

Catching Coyotes	Nick Drahos, Ed. Maunton	DJ 54–55
New York Furbearers	H. Wayne Trimm	DJ 54–55
Setting the Record Straight	H. Wayne Trimm	FM 55
That Fabulous Fellow—the Fox	Clayt Seagears	FM 55
The Care of Raw Furs	Arthur H. Cook	FM 55

GAME

A Richardson's Goose	Gerald E. Cummings	JJ 55
Black Bear in New York	.....	AM 56
Ducks in Color	.....	ON 54
Small Game Seasons	Robert Perry	AS 54
That Fabulous Fellow—the Fox	Clayt Seagears	FM 55
They Don't Come Much Bigger	.....	FM 55
Yes, But It's a Doe	.....	FM 55

GAME MANAGEMENT

Aerial Beaver Survey	A. W. Bromley	FM 56
Antlerless Deer Season in Wilderness Areas	.....	AS 54
Apples for Grouse	Greenleaf T. Chase	ON 55
A Tragedy (editorial)	.....	JJ 56
Bear Facts (2)	Greenleaf T. Chase	ON 54
Beaver Control	Francis W. Sherwood	AS 55
Checking Up on the Beaver	Ed. Maunton	DJ 54–55
Duck Banding in New York	Dirck Benson	FM 56
Ducks and the Army Engineers	Don Foley, Asa H. Smith	JJ 55
Game Habitat in New York	A. W. Holweg, Nick Drahos	ON 55
Howland Island Deer Season	.....	FM 56
Hungarian Hang-Over	John E. Wilson	FM 56
More About Wild Turkeys	Stace Robeson	DJ 55–56
More on Waterfowl Surveys	Gerald R. Rising	ON 54
Napoleon and Josephine	A. Von Borstel	AS 55
New Homes for Hares	Joseph Dell	AM 56
New York's First 2-Deer Special Season	Nick Drahos, Roy Irving	ON 54
Problems and Plans—Adirondack Coyotes	A. W. Bromley	FM 56
Rabies	Ralph Colson, Dr. W. S. Stone, Dr. Donald J. Dean	AM 55
Report on the Experimental 2-Deer Season in the Adirondacks	A. W. Bromley	FM 55
Spotlight on New York's Deer Herd	A. W. Bromley	AM 55
Too Many Deer?	E. L. Cheatum	JJ 56
Montezuma Marsh	A. W. Bromley	JJ 56
The Moose River Plains	.....	AS 54
1. History and Character	Ralph Smith	
2. Deer on the Plains	C. W. Severinghaus	
Waterfowl Management Areas	Harvey F. Warner	ON 54
Wildlife Rabies Control	James W. Kelly	AS 55
Zone Lines	E. L. Cheatum, F. A. Demeree	FM 56

GAME PROPAGATION

About Mallard Embryos	Stuart S. Peters	JJ 55
Bobwhites—on the Rise?	Ralph H. Smith	AM 56
For Ducks	.....	ON 55
Potholes	Ben Bradley	
Small Marshes	Gerald E. Cummings	
How Go the Huns in New York?	A. W. Bromley	ON 54
Scout Work	.....	FM 55

GAME RESEARCH

A Day in the Marsh	Dirck Benson	AS 55
Catskill Beaver Marathon	.....	AS 54
Diseases and Parasites of the Cottontail Rabbit	James R. Reilly, Joseph Dell	DJ 54–55
Fisher and Otter Carcasses	Dr. W. J. Hamilton, Jr.	ON 55
Fisher Carcasses Wanted	Dr. W. J. Hamilton, Jr.	ON 54
International Duck Banding	Don Schierbaum	DJ 55–56
Liver Flukes in Deer	E. L. Cheatum	ON 54
Notes on "Wilderness" Deer		DJ 55–56
Rabbit Bones Tell a Story	Joseph Dell	ON 54
Tape-Recorded Muskrats	.....	AS 54
The "Deer Ked" or "Deer Tick"	James R. Reilly	FM 56
The Growth of the Deer Antler (2)	Dr. Edgar B. Taft, Dr. Thomas C. Hall, Dr. Joseph C. Aub	FM 56
The Rabbit Cycle	.....	DJ 55–56
Wanted: Otter Carcasses	Dr. W. J. Hamilton, Jr.	FM 55
X-Rays in Wildlife	James R. Reilly	FM 55

HISTORICAL

Adirondack Center	.....	JJ 55
Adirondack Hotels	Roland B. Miller	DJ 55–56
Adirondack Museum	Roland B. Miller	DJ 55–56
A. N. Cheney and His Gun	William H. Hill	AS 55
Corn, Beans, and Bears	.....	FM 55
Evolution of the Great Seal	Roland B. Miller	AS 55
Harpoons in the Attic	A. W. Bromley	AS 54
The Adirondack Guide-Boat	Seneca Ray Stoddard	AS 55
The Carr Collection	Nancy Kincaid Vars	DJ 54–55
The Indian in His Environment	Dr. Wm. A. Ritchie	DJ 55–56
The Sugar Maple—Our New State Tree	Ed. Huber	AM 56

Trout and Trouting History Highlights	Clayt Seagears	AM 56
Trudeau	Roland B. Miller	FM 55

HOBBIES

A. N. Cheney and His Gun	Wm. H. Hill	AS 55
Houses and Feeding Stations (plans)	Roy Irving	AM 56
Fish are Worth Their Salt	Clayt Seagears	FM 56
Nice Lettering (Letters)		AS 54
Pet Trade Bonanza	Clayt Seagears	AS 54

HUMOR

Letters to the Editor	Curtis L. Brown	ON 55
Short-Circuit	Roland B. Miller	ON 54
The Elderly Bird Watcher	Lawrence A. Kohn	AM 56

HUNTING

All Hunters Aren't Hoodlums—But They Get Blamed for Those Who Are	E. W. Littlefield	ON 54
Apples for Grouse	Greenleaf T. Chase	ON 55
Deer Check Stations		ON 55
Deer Hunting, 1954		ON 54
Deer Hunting—Then and Now	Robert W. Darrow	AS 55
Gun Dogs and Conservation	A. W. Bromley	ON 55
Hunting Accidents	Bryan Burgin	JJ 55
Hunting Accidents	Roland B. Miller	FM 55
Hunting Accidents, Missouri		AS 54
Hunting for the G. I.		FM 55
Missouri's Hunting Accidents		AM 55
New Record for Black Bear		DJ 55–56
New York's 1955 Deer Kill	A. W. Bromley	AM 56
Notes on the Catskill Hare	Arthur B. Flick	DJ 55–56
Reported Black Bear Take	C. W. Severinghaus	DJ 55–56
Reported Deer Take—1951-1954		AM 55
Shooting on Great South Bay	F. R. Buckley	DJ 55–56
Small Game Hunting Preview		ON 54
Small Game Hunting Prospects		ON 55
The Deer Rifle in New York	Larry Koller	ON 55
The 1954 Deer Kill in New York	A. W. Bromley	AM 55
Utah to New York		AS 54
World's Record White-tail		JJ 55

INSECTS

Blackout for Blackflies	Dr. Donald L. Collins	JJ 55
Flies—Real and Artificial	Donald L. Collins	AM 56
Moths and Butterflies of New York	John A. Wilcox	IJ 56
Paradox Lake Blackfly Experiment	C. J. Yops	JJ 55

INSECTS (In Color)

Moths and Butterflies of New York	H. Wayne Trimm	JJ 56

INSIDE ON THE OUTDOORS

(By Clayt Seagears)

(See also classifications listing in color)

"Anticipation" (mountain lion)		DJ 55–56
Bright as Autumn (adult male green-winged teal)		ON 55
Charlotte		ON 54
Curious Characters for the Salt Water Tank		FM 56
"How are Things Getting on in There?" (male wood duck)		JJ 55
New Values for Old Land		JJ 56
New York's Sporting Spots—The Oswegatchie River Near High Falls		AS 55
Pet Parade		AS 54
Red Fox		FM 55
Ruffed Grouse		AM 55
The Big Buck and the Little Buck		DJ 54–55
Waiting for the Rise—the Adirondacks		AM 56

LAKES

Big Moose Lake	W. A. Pearce	AS 55
Carry Falls Reservoir	Donald G. Pasko	DJ 55–56
Chazy Lake	Robert G. Zilliox	DJ 54–55
Copake Lake	John S. Grim	FM 56
Cuba Lake	U. B. Stone	AS 54
deRuyter Reservoir	A. C. Petty	AM 55
Lake Cayuta	A. C. Petty	FM 56
Lake Tennanah	John S. Grim	FM 55
Loon Lake	U. B. Stone	AM 56
Meacham Lake	Robert G. Zilliox	ON 55
Millsite Lake	W. A. Pearce	JJ 56
Rich Lake	Dr. Wm. L. Webb, Earl F. Patric	AS 55
Rushford Lake	William G. Bentley	IJ 55
The Fulton Chain of Lakes		ON 54

LAND MANAGEMENT

Bootstraps Farm No. 3—Donkey Serenade	Clayt Seagears	ON 54
Bootstraps Farm No. 4—Well the Birds Like It		JJ 56
Taming the Crooked River	David G. Unger	JJ 55
The Turner Tract	E. W. Littlefield, P. W. Fosburgh	ON 55

LAWS

Antlerless Deer Season, 1955		ON 55
A Prophet in His Own Country		FM 55
Back Tags for Hunters		AS 54
Legislation, 1955	A. W. Bromley	JJ 55
Licenses	Roland B. Miller	JJ 55
License Q's and A's		ON 54
Mining Laws of New York	Percy Lieberman	FM 55
1955 Small Game Hunting Map		AS 55
Regulations (Bait Fish)	W. Mason Lawrence	DJ 54–55
Small Game Seasons (With 1954 Small Game Hunting Map)	Robert Perry	AS 54
Spear Fishing	W. Mason Lawrence	AS 55

MAMMALS

Feline Flying Saucer	Clayt Seagears	DJ 55–56
New York Furbearers	H. Wayne Trimm	DJ 54–55
Prehistoric Mammals of New York	Donald W. Fisher	FM 55

MAPS

Antlerless Deer Season, 1955	H. Wayne Trimm	ON 55
Attack on the Saddled Prominent	Nick Drahos	ON 54
Beaver Survey Chart	Roy Irving	FM 56
Beaver Trapper's Diary	Roy Irving	JJ 56
Big Moose Lake	W. A. Pearce	AS 55
Black Bear in New York	Roy Irving	AM 56
Blackout for Blackflies	Dr. Donald L. Collins	JJ 55
Broome County	H. Wayne Trimm	DJ 54–55
Campsite Data	Roy Irving	JJ 55
Carry Falls Reservoir	Donald G. Pasko	DJ 55–56
Cayuga County	Roy Irving	FM 56
Chautauqua County	Roy Irving	AS 55
Chazy Lake	Robert G. Zilliox	DJ 54–55
Chemung County	Roy Irving	JJ 55
Copake Lake	Roy Irving	FM 56
County Maps	H. Wayne Trimm	ON 54
Cuba Lake	H. Wayne Trimm	AS 54
deRuyter Reservoir	Roy Irving	AM 55
Down to the Sea—for Fish	Roy Irving	FM 56
Ducks and the Army Engineers	Roy Irving	JJ 55
Erie Canal Project	Roy Irving	DJ 55–56
Field Archery in New York	H. Wayne Trimm	ON 55
Forest Tent Caterpillar Defoliation	H. Wayne Trimm	ON 54
Lake Cayuta	Roy Irving	FM 56
Lake Ontario Lake Trout	Roy Irving	FM 56
Lake Tennanah	John S. Grim	FM 55
Loon Lake	Roy Irving	AM 56
Madison County	H. Wayne Trimm	ON 54
Meacham Lake	Roy Irving	ON 55
Millsite Lake	Roy Irving	JJ 56
Mining and Prospecting in New York	State Science Service	FM 55
Montezuma Marsh	Roy Irving	JJ 56
More Water for New York City	Roy Irving	AM 55
Non-Resident Beaver	Roy Irving	JJ 56
1955 Small Game Hunting Map		AS 55
1954 Small Game Hunting Map	Clayt Seagears	AS 54
Ocean Currents, Pollution — and Fish	U. S. G. & C. S.	FM 55
Oneida County	H. Wayne Trimm	AS 54
Onondaga County	H. Wayne Trimm	FM 55
Our Camp Program	Clayt Seagears	AM 55
Prehistoric Mammals of New York	State Science Service	FM 55

Present Status of Gypsy Moth in New York	U. S. Dept. of Entomology	AM 55
Problems and Plans—Adirondack Coyotes	A. W. Bromley	FM 56
Rabies	H. Wayne Trimm	AM 55
Report on Pollution Control	H. Wayne Trimm	ON 55
Rich Lake	Roy Irving	AS 55
Rushford Lake	William G. Bentley	JJ 55
Schuyler County	Roy Irving	DJ 55–56
Seneca County	Roy Irving	AM 56
Small Game Hunting Preview	H. Wayne Trimm	ON 54
Small Game Hunting Prospects	H. Wayne Trimm	ON 55
Small Watersheds (3)	Soil Conservation Service	ON 54
Taming the Crooked River	Roy Irving	JJ 55
The Fulton Chain of Lakes	R. M. Odell, et al.	ON 54
The Gypsy Moth	Roy Irving	JJ 56
The Moose River Plains	H. Wayne Trimm	AS 54
Tioga County	Roy Irving	AM 55
Tompkins County	Roy Irving	ON 55
Veneer Plants in Upstate New York		AS 54
Waterfowl Management Areas	H. Wayne Trimm	ON 54
Wayne County	Roy Irving	JJ 56
Zone Lines	Roy Irving	FM 56

MINERALS

Mining and Prospecting in New York	John James Prucha	FM 55
Mining Laws of New York	Percy Lieberman	FM 55

MISCELLANEOUS

Bernard's Kamp-Pack	Nick Drahos	AM 56
Cleft Grafting	Greenleaf Chase, Arthur Holweg	AM 56
Death on the Highway	C. W. Severinghaus	AM 56
Deer in Trouble	George McG. Hayes	DJ 54–55
Invasion of Albany County	Asa H. Smith	JJ 55
Lynx—or Bobcat?		DJ 54–55
Marine Note		FM 55
Medusa	John R. Greeley	ON 54
Opening Day at Rose Marsh	Dirck Benson	DJ 54–55
Opinions on Doe-Day and Monday Opening (Letters)		FM 56
Shifting Dunes	Meade C. Dobson	FM 56
Survey Completed		FM 55
The Adirondack Association		AS 54
The Big Buck and the Little Buck	Clayt Seagears	DJ 54–55
The Colorado Deer Season		FM 55
The Cover		AS 54
Those Indexes		AS 54
Woodpecker vs Scientists	H. T. Pfitzenmeyer	FM 56

PARKS

Niagara Parkway		FM 55

PERSONALITIES

Fred Streever		AM 55
In Memorium	Jacob G. Krug	JJ 55
In Memorium—a Lean-to	Wayne H. Byrne	AS 55
J. N. ("Nat") Locke		DJ 54–55
John Nemes		AM 55
Louis Agassiz Fuertes	H. Wayne Trimm	JJ 56
Mabelle I. Gillman		JJ 56
Mr. Moose Head	Fred Fohrman	AS 54
Old Hands at the Game (Letters)		AS 54
Ray Burmaster Retires		DJ 55–56
Traverse Completed (Al. King)	(editorial)	FM 55
William O'Brien		FM 55

PICTORIAL

Deer	Herbert Buckley	AM 55
Rock in Woods	P. W. Fosburgh	ON 54
The Adirondack Guide-Boat	Seneca Ray Stoddard	AS 55

POLLUTION

Control of Water Weeds	J. D. Gould	JJ 55
More on 2, 3-Dichlone	Roland B. Miller	FM 55
Ocean Currents, Pollution — and Fish	John C. Ayres	FM 55
Report on Pollution Control	George Burdick	ON 55

RECREATION

Baldwinsville Trials	Earl A. Westervelt	AS 55
Belleayre the Year 'Round	Arthur G. Draper	DJ 55–56
Lake Access Sites	W. Mason Lawrence	DJ 55–56
Maid of the Mist	Roland B. Miller	JJ 55
New York's Sporting Spots—The Oswegatchie	Clayt Seagears	AS 55
On Closing Camp for the Winter.	A. T. Shorey	ON 55
Pharsalia Grouse Trials	Paul M. Keisey	JJ 55
Summertime, Adirondacks	P. W. Fosburgh	JJ 55

REFORESTATION

Reforestation in Norway		JJ 56

REPTILES

More About Snakes	Dr. Edgar M. Reilly, Jr.	AS 55
Snakes of New York	Dr. Edgar M. Reilly, Jr.	JJ 55

RIVERS

The Hudson River Suite	Andre Kostelanetz	AS 55

SPORTSMEN'S PROJECTS

A New Deal for Pitchfork Pond.	Frank H. Morrison	DJ 55–56
Erie Canal Project	John A. Weeks	DJ 55–56
Our Job on the Shinglekill	Wm. Rice	AS 55
Seabee Operation Lean-to	W. Waterman	AM 56

STREAM IMPROVEMENT

The Straight Log Dam	David B. Cook	AS 55

SURVEYING

More About Colvin	Roland B. Miller	DJ 54–55
North 1 Degree West	A. H. King	ON 54

TRAPPING

A Trap—But for What?	H. Wayne Trimm	FM 56
Bear Trap	(letters)	AM 56
Beaver Trapper's Diary	Ed. Maunton	JJ 56
Catching Coyotes	Nick Drahos, Ed. Maunton	DJ 54–55
1955 Beaver and Otter Take		JJ 55
Skunk Trap	(letters)	AM 56
The Care of Raw Furs	Arthur H. Cook	FM 55

TREES AND SHRUBS

Blister Rust	Fred U. Sievers	DJ 55–56
The Legend of the Dogwood Tree	Rosemary Clarke	AM 56
The Sugar Maple—Our New State Tree	Ed. Huber	AM 56

VIOLATIONS

Assault	Edward Hauptman, George A. Odell	ON 55
Erie County Deer Case	E. B. Larkins	DJ 55–56
How About the Dirty Work?	(editorial)	AS 54
Road Block at Lake George	C. W. Severinghaus	FM 56
Sportsman, or Jailbird?		AS 54
The Deer Case on South Clove Mountain	James Schulhoff	AM 55
The LaDolce Case	Harry Maddren	FM 56
This Case is Not Closed		AM 56

WATER

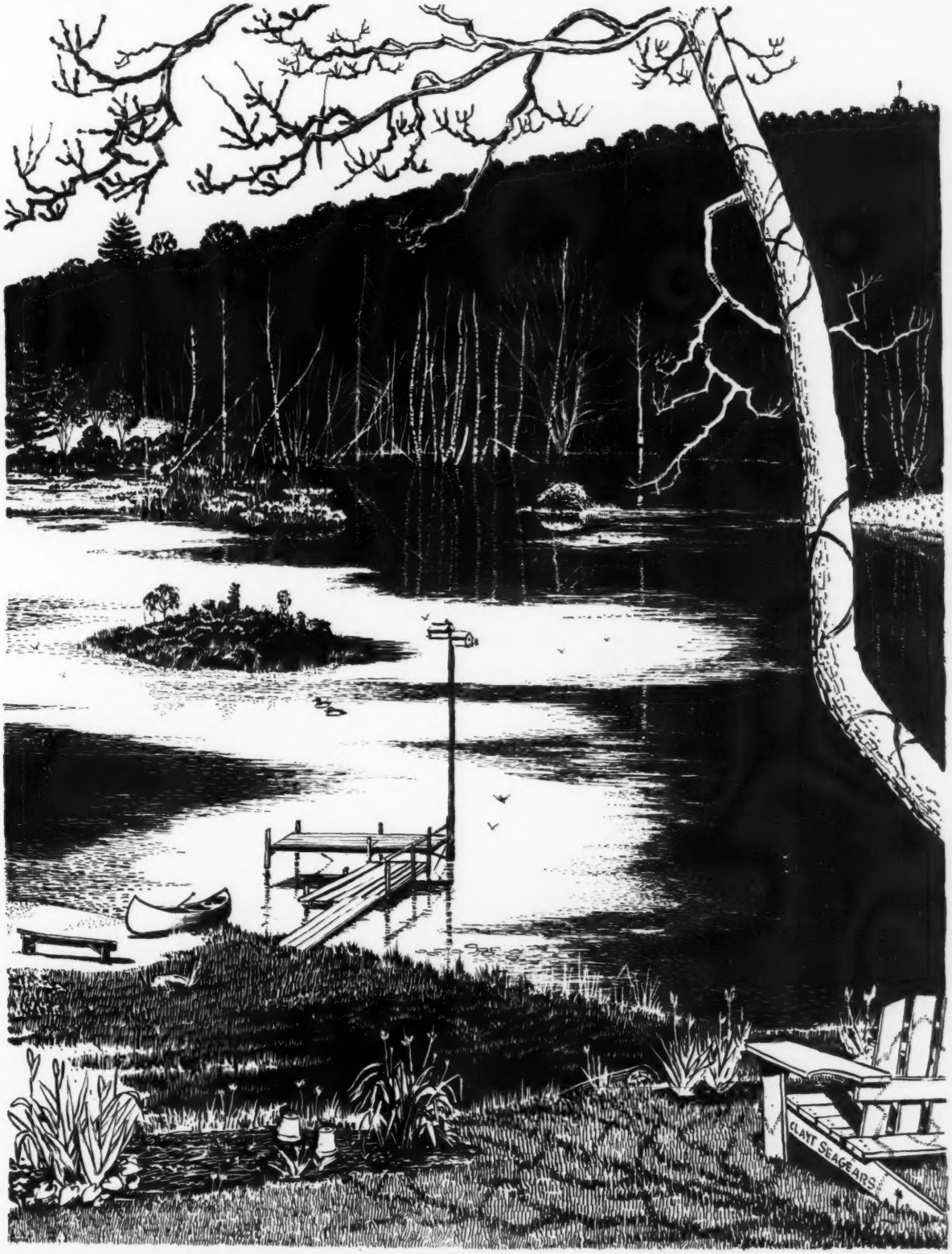
Control of Water Weeds	J. D. Gould	JJ 55
Farm Ponds (3) Construction and Costs	Roy Irving	JJ 55
More Water for New York City.	Cecil E. Heacox	AM 55
Ponds (1) Where to Build Them.	Roy Irving	FM 55
Ponds (2) Where to Obtain Assistance With Their Development	Roy Irving	AM 55
Purity Standards for the Hudson		DJ 55–56

WEATHER

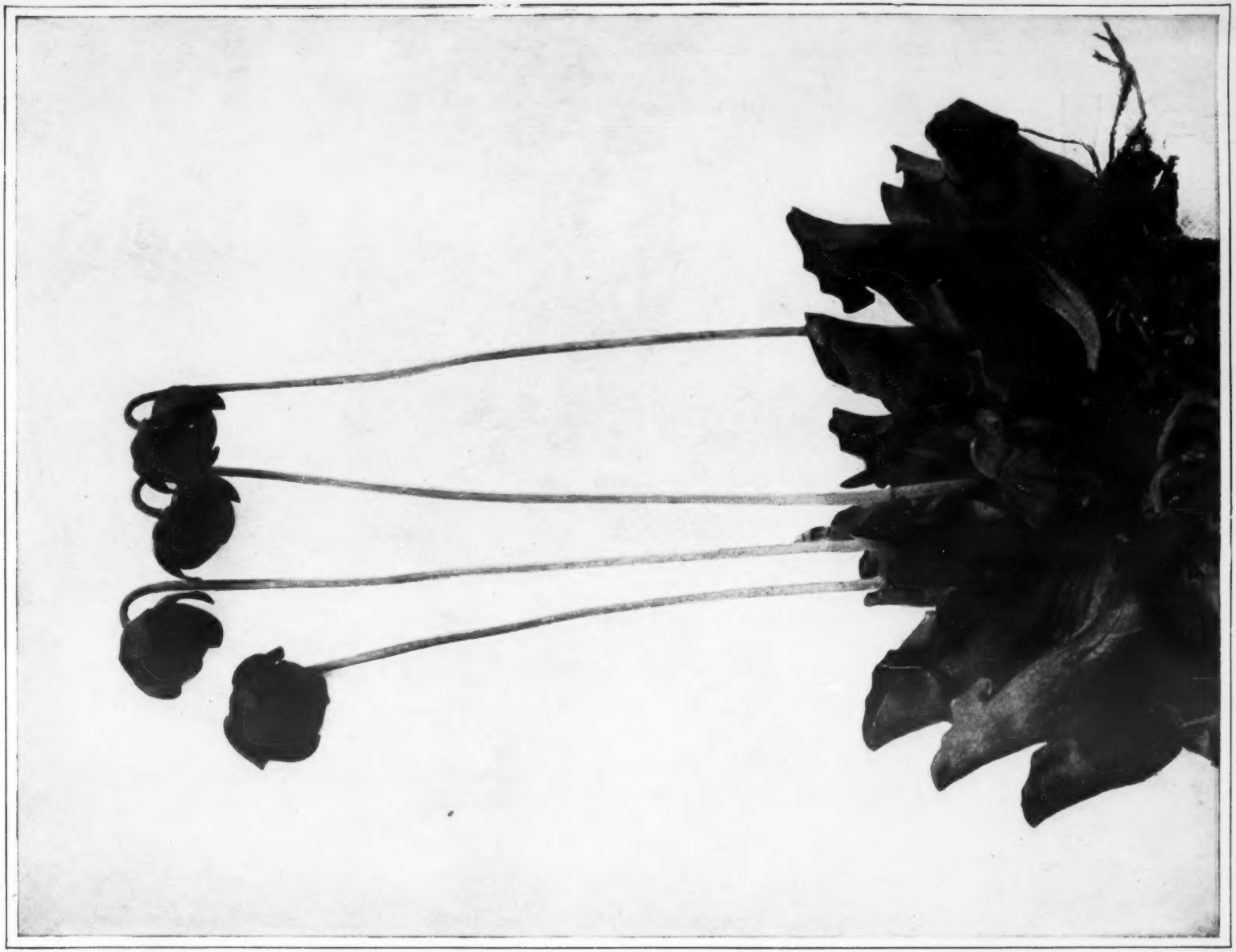
So You've Had Trouble With Hurricanes?		FM 55

WINTER SPORTS

Belleayre the Year 'Round	Arthur G. Draper	DJ 55–56
Champlain Ice Fishing Census	Robert G. Zilliox	DJ 54–55
Dipping for Smelt	A. C. Petty	AM 56



New Values for Old Land *Bootstraps Pond*



Courtesy N. Y. S. Museum

PITCHER PLANT; SIDESADDLE FLOWER
Sarracenia purpurea